

FM 101-20.

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FIELD MANUAL

9 - FEB 1981

UNITED STATES ARMY

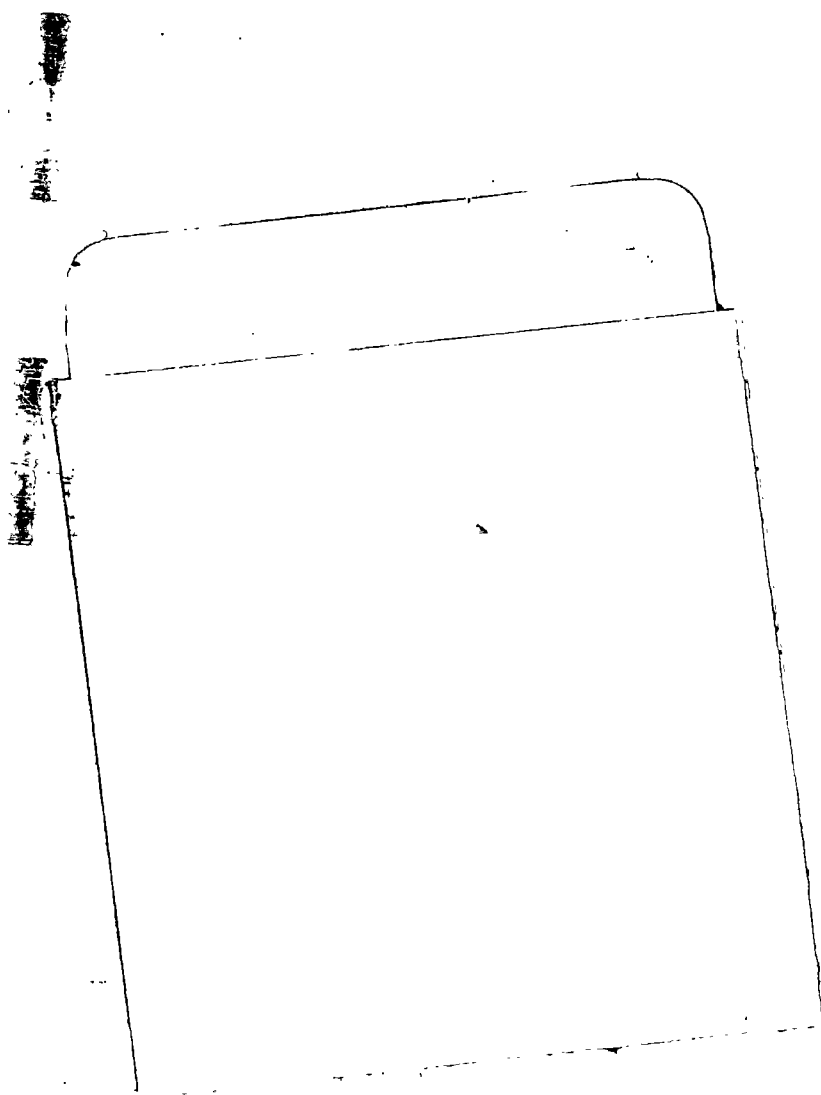
AVIATION PLANNING

MANUAL

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HEADQUARTERS, DEPARTMENT OF THE ARMY

JANUARY 1979



FOREWORD

This manual is published in accordance with the provisions of AR 95-70 and contains official U.S. Army aviation factors data in a single-source document to be used as a planning guide **ONLY**. The factors, when used with other Army program documents (e.g., Army Materiel Plan and Materiel Annex Part II to 5 Year Force Structure and U.S. Army Aircraft Standard Avionics/Surveillance Configuration, 5 Year Plan Requirement), will assist commanders, planners, and programmers in establishing a basis for operational, logistical, materiel, personnel, estimates, and the cost requirements for combat readiness of all types and models of Army aircraft. In the event such Army program documents, as mentioned above, indicate later revision, such revisions will take precedence. The data may be used in the preparation of estimates by major commands (theater, field army, or equivalent) but will not be used as a basis of reporting cost or other data.

These planning factors were developed from diversified operational and logistical statistical data and were obtained from various Department of the Army staff offices and other Army agencies having primary responsibilities for the specific mission activities or related functions.

This manual is published in looseleaf form to facilitate insertion of revisions, changes, and/or additions. Each set of published planning factors will be revised annually to ensure current and accurate data, as well as provide additional factors of interest. DARCOM is responsible for coordinating pertinent planning factors with the appropriate Army staff agency.

Users of this manual are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text. Reasons should be provided for each comment to ensure understanding and full evaluation. Comments should be forwarded direct to Headquarters, U.S. Army Materiel Development and Readiness Command, Directorate for Development and Engineering, Attn: DRCDE-D, Alexandria, Va., 22333.

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Requests from agencies outside of DOD will be forwarded to The Adjutant General, Washington, D.C. 20315.

Abbreviations used in this manual are listed in AR 310-50 (Standard abbreviations) or Military standard 12C (Non standard abbreviations).

FIELD MANUAL

NO. 101-20

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C. , 3 January 1979

UNITED STATES ARMY AVIATION PLANNING MANUAL

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

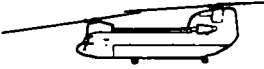
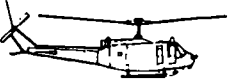
You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Troop Support & Aviation Materiel Readiness Command, ATTN: DRSTS-MTPS, 4300 Goodfellow Boulevard, St. Louis, MO 63120. A reply will be furnished directly to you.

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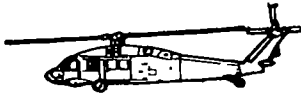
*This manual supersedes FM 101-20, 27 February 1976.

DESIGNATION OF ARMY AIRCRAFT (ROTARY WING)

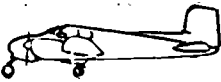
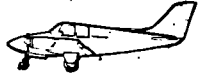
PRE-FERRED	POPULAR NAME AND TYPE	COMBAT ACCEPT SUBST	FOLLOW-ON AIRCRAFT
✓ AH-1G TH-1G	COBRA  ATTACK HELICOPTER	UH-1B UH-1C UH-1M	YAH-64A
✓ CH-47A/B/C	CHINOOK  CARGO TRANSPORT HELICOPTER		YCH-47D
✓ CH-54A/B	TARHE  CARGO TRANSPORT HELICOPTER		
✓ OH-6A OH-58A/C	CAYUSE  KIOWA  LIGHT OBSERVATION HELICOPTER		
✓ UH-1D/H EH-1H EH-1X	IROQUOIS  UTILITY HELICOPTER	UH-1B	UH-60A EH-60A
TH-55A	OSAGE  TRAINER HELICOPTER		OFF-THE-SHELF

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DESIGNATION OF ARMY AIRCRAFT (ROTARY WING) CONT'D.

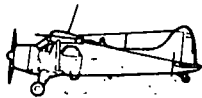
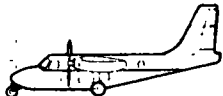
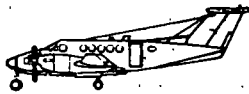
PRE-FERRED	POPULAR NAME AND TYPE	COMBAT ACCEPT SUBST	FOLLOW-ON AIRCRAFT
✓ UH-60A EH-60A EH-60B	BLACK HAWK  UTILITY HELICOPTER	EH-1X	
✓ YAH-64A	AAH  ATTACK HELICOPTER		
UH-1B/C/M	IROQUOIS  UTILITY HELICOPTER		
AH-1S	COBRA  ATTACK HELICOPTER	UH-1B UH-1C UH-1M	YAH-64A

DESIGNATION OF ARMY AIRCRAFT (FIXED WING) (Cont.)

PRE- FERRED	POPULAR NAME AND TYPE	COMBAT ACCEPT SUBST	FOLLOW-ON AIRCRAFT
U-8D/F/G RU-8D	SEMINOLE  UTILITY AIRPLANE		
U-10A	COURIER  UTILITY AIRPLANE		
U-21A/G RU-21A D/H	UTE  UTILITY AIRPLANE		
OV-1B/C/D RV-1D	MOHAWK  OBSERVATION/SURVEIL- LANCE AIRPLANE		
T-41B	MESCALERO  TRAINER AIRPLANE		OFF-THE-SHELF
T-42A	COCHISE  TRAINER AIRPLANE		OFF-THE-SHELF

AV 010095

DESIGNATION OF ARMY AIRCRAFT (FIXED WING) CONT'D.

PRE-FERRED	POPULAR NAME AND TYPE	COMBAT ACCEPT SUBST	FOLLOW-ON AIRCRAFT
U-6A	BEAVER  UTILITY AIRCRAFT		
U-9C	AERO COMMANDER  UTILITY AIRCRAFT		
C-12A RU-21J	HURON  CARGO AIRCRAFT		
UV-18A	TWIN OTTER  UTILITY STOL AIRCRAFT		
U-1A	OTTER  UTILITY AIRCRAFT		
U-21F RU-21B, C	UTE  UTILITY AIRCRAFT		

Source: DRSTS-MT

Army Aircraft Type Classification/Reclassification (TC/R) Schedule (Rotary Wing)

TYPE, MODEL SERIES (TMS)	CURRENT TYPE TCC-LCC	PROPOSED TCC-LCC	FY-Qtr of Proposed TCC-Lcc	REPLACEMENT SYSTEM
Rotary Wing				
AH-1G (TH-1G)	S-A	C-S	88-1	AH-1S
AH-1S	S-A			YAH-64A
CH-47A	S-B	C-S	81-3	YCH-47D
CH-47B	S-B	C-S	83-1	YCH-47D
CH-47C	S-A	C-S	84-3	YCH-47D
CH-54A	S-B	C-S	88-4	
CH-54B	S-B	C-S	90-4	
OH-6A	S-A	C-S	86-4	
OH-58A	S-A	C-S	86-4	OH-58C
UH-1B	S-B	C-S	80-4	UH-60A
UH-1C	S-B	C-S	83-4	UH-60A
UH-1D	S-B	C-S	82-4	UH-60A
UH-1H	S-A	C-S	82-4	UH-60A
UH-1M	S-B	C-S	83-4	UH-60A
TH-55A	S-A	C-S	84-4	UH-60A
TH-1G	S-A			
OH-58C	D	S-A	79-1	
EH-1H	L(U)	S-B	79-3	
YCH-47D	D			
UH-60A	S-A			
UH-1V	S-A			
EH-1X	S-A			EH-60A
YAH-64A	—	—	—	

Source: DRDAV-EKT

Army Aircraft Type Classification/Reclassification (TC/R) Schedule (FIXED WING)

TYPE, MODEL SERIES (TMS)	CURRENT TCC-LCC	PROPOSED TCC-LCC	FY-QTR of Proposed TCC-LCC	REPLACEMENT SYSTEM
Fixed Wing				
U-8D	S-B	C-S	80-4	
U-8F	S-B	O-O	80-4	
U-8G	S-B	C-S	80-4	
RU-8D	S-B	C-S	79-4	RU-21H
U-10A	S-B	C-S	83-4	
U-21A	S-A	C-S	88-3	
U-21F	S-A	C-S	92-1	
U-21G	S-A	C-S	91-4	
RU-21A	S-B			
RU-21B	S-B			
RU-21C	S-B			
RU-21D	S-B	O-O	80-4	
RU-21H	LU	S-B	79-2	
RU-21J	ND	SA	78-4	
OV-1B	S-B	C-S	81-4	OV-1D
OV-1C	S-A	C-S	81-4	OV-1D
OV-1D	S-A	C-S	90-4	
T-41B	S-B	C-S	86-2	
T-42A	S-A	C-S	85-1	
C-12A	S-A			
U-1A	C-F	O-O	78-4	U-21A
U-6A	C-S			U-21A
U-9C	C-S	O-O	78-4	U-21A
UV-18A	S-A			
RV-1D	S-A			

SOURCE: DRDAV-EKT

LEGEND:

TCC - Type Classification Code

- C - Contingency**
- E - Exempt**
- L - Limited Procurement**
- N - Perpetuate only until type classified**
- O - Obsolete**
- S - Standard**

LCC - Logistic Control Code

- A - Items/Systems acceptable for the intended mission**
- B - Items/Systems acceptable for the intended mission
which normally are being replaced through modernization**
- D - Items/Systems undergoing development which have not
qualified for type classification**
- F - Mission Essential Contingency Items**
- N - Exempt**
- O - Obsolete item**
- S - Contingency items other than Mission Essential Contingency
Items that are suitable for training**
- T - Items classified as Limited Procurement to provide quantities
for test**
- U - All items type classified for Limited Procurement**

CHAPTER 1

OPERATIONS

Section I AIRCRAFT AUTHORIZATIONS

Aircraft authorizations are listed by TOE unit authorizations. The current Major Item Analysis (Data Sheets) contains details concerning authorizations for specific areas or commands. The Basis of Issue (BOI) authorizations are updated to comply with the ARCSAIII evaluation.

1-1. Basis of Issue -- Aircraft Authorization Per Unit

UNIT		TOE	TOTAL ACFT	LOH	AH-1	UH-1	CH-47	CH-54	OV-1B	OV-1C	OV-1D	U-21
ARMORED DIVISION	RECAP	17	170	66	51	53						
Combat Aviation Battalion	RECAP	17-85	143	56	42	45						
Attack Helicopter Co (2)		17-387	72	24	42	6						
Cbt Spt Avn Co		57-57	23			23						
Division Aviation Co		17-87	46	32		14						
Trans Acft Maint Co		55-424	2			2						
Armored Cavalry Sqdn	RECAP	17-105	27	10	9	8						
Air Cavalry Troop		17-108	27	10	9	8						
INFANTRY DIVISION (MECH)	RECAP	37	170	66	51	53						
Combat Aviation Battalion	RECAP	17-85	143	56	42	45						
Attack Helicopter Co (2)		17-387	72	24	42	6						
Cbt Spt Avn Co		57-57	23			23						
Division Aviation Co.		17-87	46	32		14						
Trans Acft Maint Co		55-424	2			2						
Armored Cavalry Sqdn	RECAP	17-105	27	10	9	8						
Air Cavalry Troop		17-108	27	10	9	8						
INFANTRY DIVISION	RECAP	7	215	74	48	93						
Combat Aviation Battalion	RECAP	57-55	130	44	21	65						
Cbt Spt Avn Co (2)		57-57	46			46						
Avn Gen Spt Co		57-58	46	32		14						
Attack Helicopter Co		17-387	36	12	21	3						
Trans Acft Maint Co		55-89	2			2						
Air Cavalry Sqdn	RECAP	17-205	85	30	27	28						
HHT, Air Cav Sqdn		17-206	4			4						
Air Cavalry Troop (3)		17-208	81	30	27	24						
AIRBORNE DIVISION	RECAP	57	215	74	48	93						
Combat Aviation Battalion	RECAP	57-55	130	44	21	65						
Cbt Spt Avn Co (2)		57-57	46			46						
Avn Gen Spt Co		57-58	46	32		14						
Attack Helicopter Co		17-387	36	12	21	3						
Trans Acft Maint Co		55-89	2			2						
Air Cavalry Sqdn	RECAP	17-275	85	30	27	28						
HHT, Air Cav Sqdn		17-276	4			4						
Air Cavalry Troop		17-278	81	30	27	24						

1-1. Basis of Issue -- Aircraft Authorization Per Unit (Cont.)

UNIT		TOE	TOTAL ACFT	LOH	AH-1	UH-1	CH-47	CH-54	OV-1B	OV-1C	OV-1D	U-21
AIRMOBILE DIVISION	RECAP	67	470	122	90	210	48					
Division Artillery	RECAP	6-700	19	16		3						
Aviation Battery		6-702	19	16		3						
Aviation Group	RECAP	7-200	314	52	63	151	48					
GS Aviation Co		7-202	26	10		16						
Assault Helicopter Bn (2)	RECAP	7-255	126	6		120						
HHC, Aslt Hel Bn (2)		7-256	6	6								
Assault Helicopter Co (6)		7-257	120			120						
Medium Helicopter Bn	RECAP	55-165	50			2	48					
HHC, Medium Hel Bn		55-166	2			2						
Medium Helicopter Co (2)		55-167	48				48					
Attack Helicopter Bn	RECAP	17-385	112	36	63	13						
HHC, Atk Hel Bn		17-386	4			4						
Attack Helicopter Co (3)		17-387	108	36	63	9						
Air Cavalry Squadron	RECAP	17-95	85	30	27	24						
HHT, Air Cav Sqdn		17-96	4			4						
Air Cavalry Troop (3)		17-98	81	30	27	24						
Medical Battalion	RECAP	8-25	12			12						
HHC, Medical BN		8-26	12			12						
TC Battalion	RECAP	55-405	4			4						
Trans Acft Maint Co (2)		55-407	4			4						
HHC, Ambl Div Bde (3)		67-42	36	24		12						
AIR CAV CBT BDE	RECAP	17-200	336	106	153	61	16					
Hq & Hq Troop, ACCB		17-202	9	4		5						
Attack Helicopter Bn (2)	RECAP	17-385	224	72	126	26						
HHC, Atk Hel Bn (2)		17-386	8			8						
Attack Helicopter Co (6)		17-387	216	72	126	18						
Air Cavalry Sqdn	RECAP	17-205	85	30	27	28						
HHT, Air Cav Sqdn		17-206	4			4						
Air Cavalry Troop (3)		17-208	81	30	27	24						
Support Battalion	RECAP	29-155	18			2	16					
Trans Acft Maint Co		55-417	2			2						
Medium Helicopter Co		55-167	16				16					
(Medical Co, ACCB)		8-157	(4)			(4)						

1-1. Basis of Issue -- Aircraft Authorization Per Unit (Cont.)

UNIT	TOE	TOTAL ACFT	LOH	AH-1	UH-1	CH-47	CH-54	OV-1B	OV-1C	OV-1D	U-21
ARM CAV REGT HHT, Arm Cav Regt Air Cavalry Spt Troop Combat Spt Troop	RECAP 17-51 17-52 17-58 17-59	75 19 27 29	29 6 10 13	9 9	37 13 8 16						
HHC, Sep Inf Bde HHC, Sep Armd Bde HHC, Sep Inf Bde (MECH) HHC, Sep Abn Bde HHC, Sep Lt Inf Bde	7-102 17-102 37-102 57-102 77-102	11 8 8 11 11	8 6 6 8 8		3 2 2 3 3						
Command Airplane Co	1-117	21									21
Corps Aviation Co	1-127	39	20		17						2
Army Aviation Co	1-137	41	15		14						12
Aviation ATC Unit	1-207	4			3						1
HHD Air Traffic Control Gp	1-222	2									2
Air Traffic Control Bn HHD, ATC Bn	RECAP 1-225 1-226	3 3			3 3						
Aslt Spt Hel Co	1-258	17			1	16					
Aviation Spt Det	1-277	11	5		6						
Aviation Operating Teams	1-500	—	1	1	1	1	1		1	1	1
HHC, Engr Gp	5-52	7	3		4						
HHC, Engr Cmd	5-201	5	2		2						1
HHB, Pershing Bde	6-604	16			16						

1-1. Basis of Issue - Aircraft Authorization Per Unit (Cont.)

UNIT	TOE	TOTAL ACFT	LOH	AH-1	UH-1	CH-47	CH-54	OV-1B	OV-1C	OV-1D	U-21
Cbt Spt Avn Co	7-357	23			23						
Med Air Ambulance	8-137	25			25						
Army Cmd Sig Bn	RECAP 11-75	3			1						
HHD, Army Cmd Sig Bn	11-76	3	2		1						
Army Area Sig Bn	RECAP 11-85	1	1								
HHC, Army Area Sig Bn	11-86	1	1								
Signal Bn, ABN Corps	RECAP 11-225	3			3						
HHC, Signal Bn ABN	11-226	3			3						
Signal Bn, Cmd Op	RECAP 11-405	12	7		5						
HHC, Signal Bn, Cmd Op	11-406	12	7		5						
Attack Helicopter Bn	RECAP 17-385	112	36	63	13						
HHC, Attack Hel Bn	17-386	4			4						
Attack Helicopter Co (3)	17-387	108	36	63	9						
Attack Helicopter Co	17-387	36	12	21	3						
HHC, MP Gp	19-272	5	5								
Scout Org	20-500	2			1						1
MI Co, Aerial Survl	30-79	18								18	
MI Co, Aerial Survl	30-88	18						12	6		
MI Co, Aerial Survl	30-128	18						6	12		
MI Det, Aerial Survl	30-600	6								6	
ASA Div Spt Co	32-57	3			3 $\frac{1}{2}$						
ASA Bde Spt Co	32-64	2			2 $\frac{1}{2}$						
Med EVAC Tm RH, Hel Amb	8-660	6			6						
Aerial Exploit Bn Relap	30-105	30							24 $\frac{3}{4}$	6 $\frac{2}{3}$	
CBTI CO (AS)	30-179	18									
EW AVN CO, FWD	30-199	12							6 $\frac{2}{3}$	6 $\frac{2}{3}$	

1-1. Basis of Issue -- Aircraft Authorization Per Unit (Cont.)

UNIT	TOE	TOTAL ACFT	LOH	AH-1	UH-1	CH-47	CH-54	OV-1B	OV-1C	OV-1D	U-21
ASA Aviation Co	32-99	12									
Medium Helicopter Bn	55-165	75			3	72					
Medium Helicopter Co (3)	55-167	75			3	72					
Medium Helicopter Co	55-167	25			1	24					
Heavy Helicopter Co	55-259	10			1		9				
Trans Acft Maint Co	55-457	2			2						
Trans Acft Maint Co	55-458	3			2	1					
Trans Acft Maint Co	55-459	2			2						
Division (Training)	97	2			1						1

1 / EH-1 Acft2 / RU or RV Acft3 / 6EA RV-1D & 18 EA OV-1D

Source: DRSTS-SPME

1-2. Test and Test Support Aircraft.

Requirements for test and test support aircraft are established as follows:

a. All plans of test or research/development programs which require the use of aircraft for any phase will identify the specific type of aircraft required and the purpose (e.g., competitive evaluation of navigation aids in utility helicopter, air transportability of missile in cargo helicopter).

b. The agency providing test service to customers normally requires one aircraft to support two plans of test, with the following exceptions:

(1) An aircraft which is on bailment for an extended period cannot be considered as an available asset to fill additional requirements.

(2) An aircraft which has been modified to a special configuration (flying lab, armament test bed) in support of a particular specialized long range R & D program may not be considered as a suitable available asset to apply against normal test and test support aircraft requirements during a given fiscal year. (However, this aircraft may become available for use in other programs in subsequent years.) Nonstandard aircraft assets shall not be considered as suitable substitutes for Army aircraft when computing test and test support aircraft requirements. Requirements should be based on use of Army-type aircraft to support Army programs. Use of nonstandard aircraft (C-47, T-28) for Army test programs will be authorized only if an Army-type aircraft cannot be made available or is not suitable for the intended purpose.

Example: A USAF jet aircraft may be necessary for missile chase at firing sites.

c. In addition to aircraft originally assigned to support research, development, test, and evaluation, additional aircraft may be allocated, if required, in accordance with revised development/test programs.

1-3. Authorized Aircraft Designations.

a. All Department of Army Aircraft have been assigned designations in accordance with provisions of AR 70-50. Explanation of terms are as follows:

(1) Status prefix symbol. The status symbol (letter), will indicate an aircraft being used for experimentation and special or service test and will be placed at the immediate left of the modified mission symbol, or the mission/type symbol if no modified mission symbol is applicable.

(2) Modified mission symbol. A letter used to indicate the current capability of an aircraft when it is so modified that its original intended capability is no longer applicable, or when it has an added or restricted capability. The modified mission symbol will consist of a prefix letter placed at the immediate left of the basic mission or type symbol. Only one modified mission symbol will be used in any one designation.

(3) Basic mission symbol. A letter used to indicate the basic intended function or capability of the aircraft, such as observation, utility, etc.

(4) Type symbol. An additional letter which designates helicopter and V/STOL aircraft. An aircraft identified by a type symbol, such as "H" for helicopter, will be further identified by only one mission symbol whether it be basic mission or a modified mission symbol. (A basic mission or type symbol, once officially assigned, will not be changed without the approval of the Assistant Secretary of Defense (Installation and Logistics).

(5) Design number. The sequence number of each new design of the same basic mission or type aircraft. A number will be assigned consecutively for each basic mission or type. New design numbers will be assigned when an existing aircraft is redesigned to an extent that it no longer reflects the original configuration or capability.

(6) Series letter. A letter used to denote differences affecting the relation of the vehicle to its ground environment, and major modifications to the aircraft which result in significant changes to its logistic support. A letter will be assigned to each series change of a specific basic design. In designing new aircraft, the series letter will be in consecutive order

starting with the letter "A." To avoid confusion, the letters "I" and "O" will not be used as series symbols. (Examples of series symbol change would be installation of different engines, propellers, extra fuel tank, etc.)

(7) Complete designation. The complete designation shall consist of items (1) through (6) as applicable, in the order shown. A dash (-) will be inserted between the basic mission/type symbol and the design number.

EXAMPLE:**Y U H - 1 A**

Status Prefix Symbol (Prototype) ←

Basic Mission Symbol (Utility Mission) ←

Type Symbol (Helicopter Type) ←

Design Number (No. Type Helicopter) ←

Series Letter (1st Series) ←

b. Status prefix symbols (classification letters) are as follows:

LETTER	TITLE	DESCRIPTION
G	Permanently Grounded	An aircraft permanently grounded, used for ground instruction and training.
J	Special Test, Temporary	Aircraft on special test programs by authorized organizations or on bailment contract having a special test configuration or whose installed property has been temporarily removed to accommodate the test. At completion of the test, the vehicle will be returned either to its original configuration or to standard operational configuration.
N	Special Test, Permanent	Aircraft on special test programs by authorized activities or on bailment contract, whose configuration is so drastically changed that return of aircraft to its original configuration or conversion to standard operational configuration is beyond practicable or economical limits.
X	Experimental	Aircraft in a developmental, experimental stage where basic mission symbol and design number have been designated but not established as a standard vehicle.

LETTER	TITLE	DESCRIPTION
Y	Prototype	Aircraft procured in limited quantities to develop the potentialities of the design.
Z	Planning	Designations used for identification purpose during the planning or pre-development stage.

c. Modified missions symbols (prefix letters) are as follows:

LETTER	TITLE	DESCRIPTION
A	Attack	Aircraft modified to search out, attack, and destroy enemy land or sea targets, using conventional or special weapons. Also used for interdiction and close air support mission.
C	Cargo/Transport	Aircraft modified for carrying cargo and/or passengers.
E	Special Electronic Installation	Aircraft equipped with electronic devices for employment in one or more of the following missions. (1) Electronic countermeasures (2) Airborne early warning radar (3) Airborne command control including communications relay (4) Tactical data communications link for all nonautonomous modes of flight.
Q	Drone	Aircraft modified to be controlled from a point outside the aircraft.
R	Reconnaissance	Aircraft modified and permanently equipped for photographic and/or electronic reconnaissance missions.
T	Trainer	Aircraft modified and equipped for training purposes.
U	Utility	Aircraft having small payload, modified to perform miscellaneous missions such as carrying cargo or passengers, and towing targets.
V	Staff	Aircraft modified to provide accommodations such as chairs, tables, lounge, and berths for the transportation of staff personnel.

d. Basic mission and type symbols are as follows:

LETTER	TITLE	DESCRIPTION
A	Attack	Aircraft designed to search out, attack, and destroy enemy land or sea targets, using conventional or special weapons. Also used for interdiction and close air support missions.

LETTER	TITLE	DESCRIPTION
C	Cargo/ Transport	Aircraft designed for carrying cargo and/or passengers.
H	Helicopter	A rotary-wing aircraft designed with the capability of flight in any plane; e.g., horizontal, vertical, or diagonal.
O	Observation	Aircraft designed to observe (through visual or other means) and report tactical information concerning composition and disposition of enemy forces, troops, and supplies in an active combat area.
R	Reconnaissance	Aircraft designed to perform reconnaissance missions.
T	Trainer	Aircraft designed for training personnel in the operation of aircraft and/or related equipment, and having provisions for instructor personnel.
U	Utility	Aircraft used for miscellaneous missions such as carrying cargo and/or passengers, towing targets, etc. These aircraft include those having a small payload.
V	VTOL and STOL	Aircraft designed for vertical takeoff or landing with no takeoff or landing roll, or aircraft capable of takeoff and landing in a minimum prescribed distance.
X	Research	Aircraft designed for testing configurations of radical nature. These aircraft are not normally intended for use as tactical aircraft.

e. Application for a special aircraft designation or cancellation of a previously authorized designation may be accomplished by addressing the request CDR, US Army Materiel Development and Readiness Command, ATTN: DRCDE-D, Alexandria, VA 22333. Application for status prefix symbol "J" (Special Test, Temporary) will be forwarded to CDR, USATSARCOM, ATTN: DRSTS-X(2), St. Louis, MO 63120, providing complete identification, purpose/justification and length of time required.

f. A complete listing of model designations assigned to military aircraft is contained in Army AR 70-50.

Section II. FLYING HOUR PROGRAM

The flying hour program can be calculated by taking the average inventory for the command and multiplying it by the annual flying hour rate for the particular aircraft.

Example:

FORSCOM	
OV-1 - Fiscal year 1975	
Average number of aircraft	21
Annual flying hour rate	216
21 X 216 = 4536 hours	

Source: DCSOPS-DAMO

1-4. Basic Annual Flying Hour Planning Factors

a. A Worldwide Flying Hour Program is developed annually by the Department of the Army for use in budget preparation and in planning for logistical support of aircraft. It is used as a basis for management of the entire aircraft inventory and is not applicable to the operation of a single aircraft or to the aircraft of any specific aviation unit or activity.

b. The flying hour program for each major command is published annually in Chapter V, Section 4 of the Department of the Army Program and Budget Guidance Document. This document lists flying hour guidance in bulk flying hours for each type of aircraft assigned to the major commands. Factors considered in development of command flying hour programs include: the projected aircraft inventory, mission requirements of the command, aviator availability,

budgetary limitations, logistical considerations and other variables which may affect aircraft utilization within the commands. The DA Flying Hour Program is not expressed in flying hour rates. An additional factor to be considered in development of command flying hour programs is the aviator training requirement of the new aircrew training manuals (TC1-134 series) as prescribed by AR 95-1.

c. The basic flying hour planning factors contained below are suitable for use in intermediate and long range planning at any level of command. Two points of rationale used in the development of these factors should be considered in planning applications; these are:

(1) Aircraft assigned to TOE units are intended to meet combat requirements. In a peacetime situation or noncombat environment, utilization of these aircraft should be restricted to only that flying time necessary to provide adequate training for aviation units and other units which are supported by aviation units.

(2) Indirect support aircraft are assigned to TDA units and must meet specific administrative, training, or RDTE requirements. Utilization of indirect support aircraft, except training and training support aircraft assigned to the aviation training base and RDTE aircraft, must meet or exceed the planning factors shown, to justify retention in the aircraft inventory at every level of command. Utilization of training base aircraft is determined by the student training rate approved or programmed for the year under consideration. Utilization of RDTE aircraft is basically determined by the requirements of the RDTE programs supported.

1-5. Table of Basic Flying Hour Planning Factors 1/

TYPE AIRCRAFT	TOE PEACETIME (WORLDWIDE) ENVIRONMENT		TOE ACTIVE COMBAT ENVIRONMENT		INDIRECT SUPPORT AIRCRAFT (WORLDWIDE) ALL ENVIRONMENT <u>2/</u>	
	AVG MON	AVG YR	AVG MON	AVG YR	AVG MON	AVG YR
U-21 A, F, G	35	420	74	888	35	420
OV-1 B, C, D/RV-1D	20	240	58	696	25	300
	—	—	—	—	—	—
OH-6 A	20	240	68	816	25	300
OH-58 A	20	240	68	816	25	300
UH-1 B/C/M	20	240	55	660	25	300
UH-1 D/H	25	300	79	948	25	300
AH-1 G, S,	20	240	65	780	25	300
CH-47 A, B, C	20	240	58	696	25	300
CH-54 A, B	15	180	43	516	25	300
C12	35	420	74	888	35	420
U-8 D, F, G	35	420	74	888	35	420
RU-21 A,B,C,D, H,J	35	420	74	888	35	420
EH-1H/EH-1X	25	300	79	948	25	300
UH-60A	25	300	76	912	35	420

1/All factors include operational readiness float aircraft.

2/Does not include training and training support aircraft assigned to the training base, RDTE (test and test support) aircraft, or aircraft type classified contingency.

Source: DCSOPS-DAMO-RQD

Section III. REPLACEMENT FACTORS (ATTRITION)

1-6. Replacement Factors, World-Wide Monthly Rates.

AIRCRAFT SYSTEMS	WORLD-WIDE PEACETIME FACTORS				
	77	78	79	80	81
Airplane:					
OV-1	.0007	.0007	.0007	.0007	.0007
RV-1		.0000 1/	.0000 1/	.0000 1/	.0000 1/
T-41	.0008	.0008	.0008	.0008	.0008
T-42	.0000 1/	.0000 1/	.0000 1/	.0000 1/	.0000 1/
U-8/RU-8	.0028	.0028	.0000 2/	.0000 2/	.0000 2/
U-21	.0012	.0008	.0008	.0008	.0012
C-12A	.0000 1/	.0001 1/	.0001 1/	.0001 1/	.0001 1/
RU-21	.0000 1/	.0001 1/	.0001 1/	.0001 1/	.0001 1/
Helicopter:					
TH-1	.0005	.0017	.0017	.0017	.0017
TH-55	.0008	.0011	.0011	.0011	.0011
CH-47	.0000 1/	.0005	.0005	.0005	.0005
CH-54	.0000 1/	.0000 1/	.0000 1/	.0000 1/	.0000 1/
OH-6	.0006	.0008	.0008	.0008	.0008
OH-58A/C	.0006	.0007	.0007	.0007	.0007
UH-1/EH-1H/EH-1X	.0004	.0005	.0005	.0005	.0005
AH-1G/S	.0005	.0017	.0017	.0017	.0017
UH-60A		.0004	.0004	.0004	.0004
YAH-64A				.0005	.0005

1/ No positive predictors are available for low density MDS fleets that have experienced very few losses.

2/ System being phased out.

NOTE: Aircraft type classified contingency not included on chart and new average with unestablished factors are not included on chart.

REFERENCES: SB710-1-1
AR700-5

Source: DALO-AV

Comments:

To arrive at average peacetime operational inventory, (standard aircraft only), the following categories were not considered:

- a. Combat inventory and losses
- b. Maintenance trainers
- c. Depot inventory
- d. Aircraft in transit
- e. Losses due to natural phenomena
- f. Losses due to obsolescence

Section IV. STANDARD AIRCRAFT CHARACTERISTICS

Standard aircraft characteristic data contained herein will change as modifications or additions and deletions of aircraft components or equipment are made.



Figure 1-1. AH-1G and TH-1G

Will be furnished at a later date —

Figure 1-1A. AH-1S

DIMENSIONS

Rotor dia	44 Ft.
Length:	
Rotors	
operating	53 Ft.
Fuselage	45 Ft. 2-1/4 In.
Span (max lateral)	10 Ft. 4 In.
Height	11 Ft. 7 In.
Tread	7 Ft. 4 In.
Rotor gnd clearance (static)	7 Ft. 10 In.

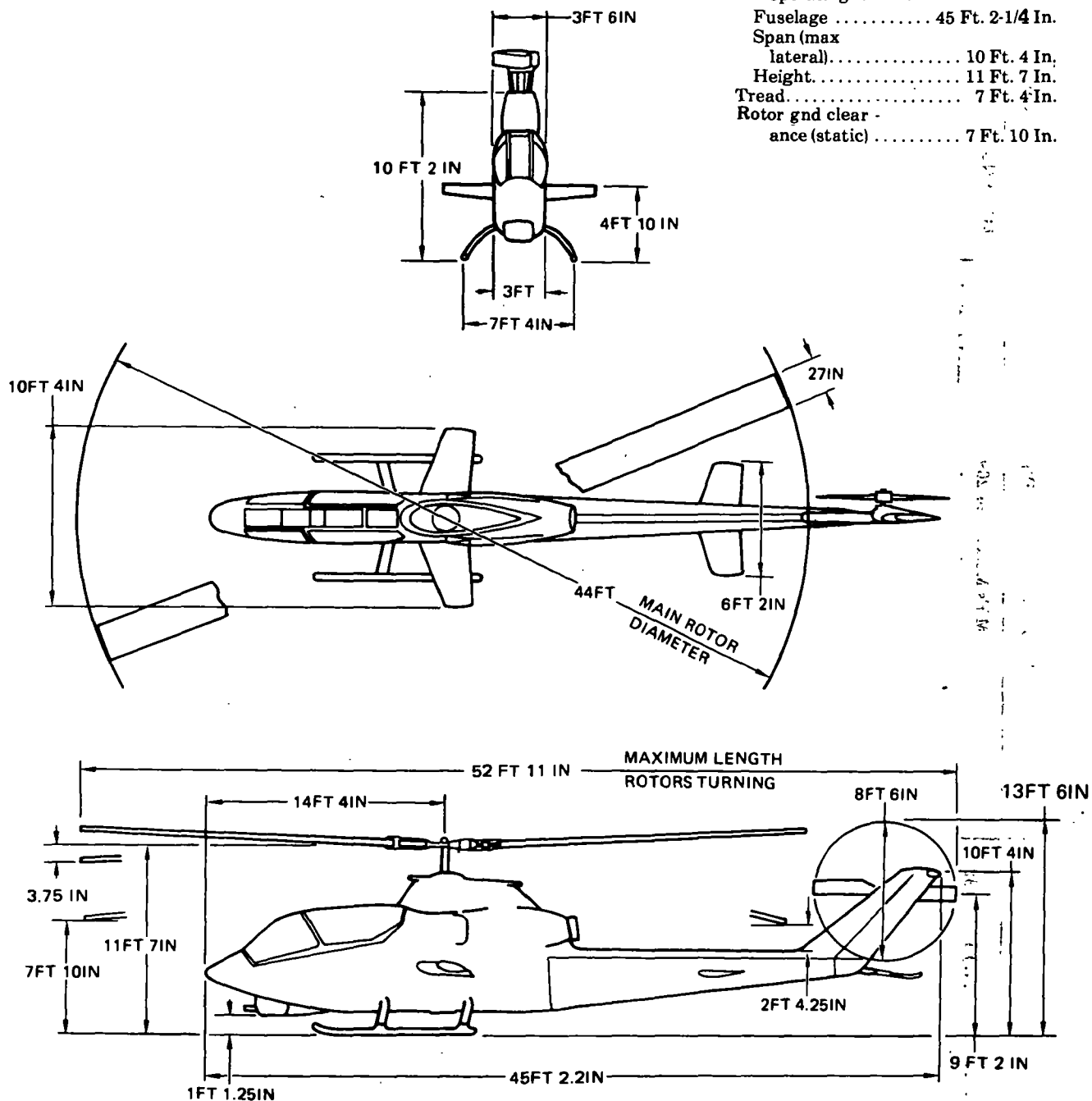


Figure 1-2. Principal Dimensions, AH-1G and TH-1G

1-7. AH-1G/TH-1G* (Hueycobra) Characteristics.

ENGINE				MISSION AND DESCRIPTION		WEIGHTS	
No. and Model (1) T53-L-13B Mfr Lycoming Engine Spec. No. 104.33 Type Free Power Turbine Reduction Gear Ratio 0.3115 Tail Pipe Fixed Area Augmentation None				Mfr's Model: Bell 209 The primary missions of this aircraft are those of an armed tactical helicopter capable of delivering weapons fire, low altitude high speed flight, search and target acquisition, reconnaissance by fire, multiple weapons fire support, and troop helicopter support. The aircraft is capable of performing these missions from prepared or unprepared areas, under day and night VFR conditions within a temperature range of -25°F to +125°F. The gas turbine powered "Hueycobra" is of compact design featuring tandem seating to give both pilot and gunner nearly unlimited visibility. Both crew stations have flight control and fire control systems permitting flexibility in division of functions under all normal and emergency situations. A mission designed fuselage coupled with the 540 rotor system gives a low vibration level plus increased maneuverability and speed. Four wing stores stations and an integral chin turret provide a high degree of armament versatility with the capability of quickly changing a wide combination of weapons to match the desired mission. Reliability and maintainability are ensured through the use of many UH-1 parts which have been combat proven. Other features include a crashworthy fuel system with closed circuit refueling capability, and a tractor tail rotor system.		LOADING LB. Empty 5809 (C) Combat Clean 8521 (C) Light Scout 9500 (C) Heavy Scout 9500 (C) Hog 9500 (C) Max. Takeoff 9500 Max. Landing 9500 (C) Calculated	
ENGINE RATING				DEVELOPMENT Date of contract 4 April 1966 First flight (Similar aircraft) 7 September 1965 First acft delivered 18 September 1966		FUEL AND OIL	
SEA LEVEL STD SHP RPM MIN Military 1400 6600 30 Normal 1250 6600 Cont.						Fuel: Grade JP-4/5 Spec MIL-T-5624 No. tanks 2 Location Fuselage Qty 262 gal Oil: Spec MIL-L-7808/ MIL-L-23699 No. tanks 1 Location Fuselage Qty 3.4 gal	
TECHNICAL PUBLICATIONS						AVIONICS / ARMAMENT Refer to Chapter 2.	
AIRFRAME: TM55-1500-339-S TM55-1500-220-PM TM55-1520-221-10 & 10 CL TM55-1520-221-20 TM55-1520-221-34 TM55-1520-221-23P TM55-1520-221-PMS TM55-1520-221-MTF ENGINE: TM55-2840-229-24 TM55-2840-229-23P				FEATURES Advanced flexible gun turret. Armor protection for crew and critical components. Hardpoints for rockets, and external stores on wings. Stability Control Augmentation System (SAS) eliminates stabilizer bar and provides a stable gun platform.		PERSONNEL Light Scout, Heavy Scout or Hog Mission Pilot 1 Gunner 1 Ferry Mission Pilot 1 Copilot 1	
						FLYAWAY COSTS / NSN AH-1G, NSN 1520-00999-5821 LINE K29660, FLYAWAY COST \$509,833	

*TH-1G. Addition of Instructor Flight Controls and Instrument Panel converts the AH-1G to the TH-1G.

1-8. Loading and Performance — Typical Mission AH-1G and TH-1G

CONDITIONS	MISSION I LIGHT SCOUT	MISSION II HEAVY SCOUT	MISSION III HOG	MISSION IV FERRY (CLEAN)
TAKEOFF WEIGHT(lb)	9171	9500	9500	7671
Fuel at 6.5 lbs/gal (Grade JP-4)(lb)	1572	1277	1025	1672
Payload(lb)	1792	2416	2668	192
Takeoff Power Loading(lb SHP)	8.34	8.64	8.64	6.97
Disk Loading(lb sq ft)	6.04	6.25	6.25	5.05
Autorotation Speed (Min R/D)(kn)	65	65	65	65
Takeoff Ground Run at SL(ft)	105	127	127	0
Takeoff to Clear 50 ft(ft)	267	344	344	0
Vertical Rate of Climb at SL(fpm)	-	-	-	1210
Maximum Rate of Climb at SL(fpm)	1330	1230	1230	1860
Speed for Max R/C at SL(kn)	64	65	65	60
Time: SL to 5000 ft(min)	3.7	4.0	4.0	2.7
Time: SL to 10,000 ft(min)	8.3	9.2	9.2	5.6
Service Ceiling (100 fpm)(ft)	12450	11420	11420	18200
Absolute Hovering Ceiling(ft)	-	-	-	10650
COMBAT RANGE(nmi)	-	-	-	371.1
Average Cruise Speed(kn)	-	-	-	141
Cruising Altitude (Initial)(ft)	-	-	-	10000
Cruising Altitude (Final)(ft)	-	-	-	10000
Total Mission Time(hr)	-	-	-	2.7
COMBAT RADIUS(nmi)	141.1	95.3	70.1	-
Average Cruise Speed(kn)	133	125	125	-
Cruising Altitude (Outbound)(Min/Max) .(ft)	6350/9800	5350/7250	5600/7200	-
Cruising Altitude (Inbound)(ft)	10000	10000	10000	-
Total Mission Time(hr)	2.4	1.8	1.4	-

1-8. Loading and Performance — Typical Mission AH-1G and TH-1G (Cont.)

CONDITIONS	MISSION I LIGHT SCOUT	MISSION II HEAVY SCOUT	MISSION III HOG	MISSION IV FERRY (CLEAN)
COMBAT WEIGHT(lb)	8148	7937	7020	6231
Combat Altitude(ft)	Sea Level	Sea Level	Sea Level	10000
Combat Speed(kn) (2)	140	137	132	155
Combat Climb(fpm) (2)	1665	1745	2140	2170
Combat Ceiling (500 ft/min)(ft) (2)	15350	16250	20200	23800
Service Ceiling (100 ft/min)(ft) (2)	16300	17100	21000	24550
Absolute Hovering Ceiling(ft) (1)	8500	9450	13750	17700
Takeoff Ground Run at SL(ft) (1) <u>3/</u>	0	0	0	0
Takeoff to Clear 50 ft(ft) (1) <u>3/</u>	0	0	0	0
Maximum Rate of Climb at SL(fpm) (2) <u>3/</u>	1665	1745	2140	2490
Speed for Max R/C at SL(kn) (2) <u>3/</u>	62	61	58	54
Max Speed at SL(kn) (2)	140	137	132	149
Basic Speed at 5000 ft(kn) (2) <u>3/</u>	142	139	135	154
LANDING WEIGHT(lb)	7413	7383	6578	6231
Ground Roll at SL(ft)	0	0	0	0
Total from 50 ft(ft)	0	0	0	0

DIMENSIONS

Rotor dia	44 Ft.
Length:	
Rotors	
operating	53 Ft.
Fuselage	44 Ft. 9 In.
Span (max lateral)	10 Ft. 9 In.
Height	11 Ft. 7 In.
Tread	7 Ft. 4 In.
Rotor gnd clearance (static)	7 Ft. 10 In.

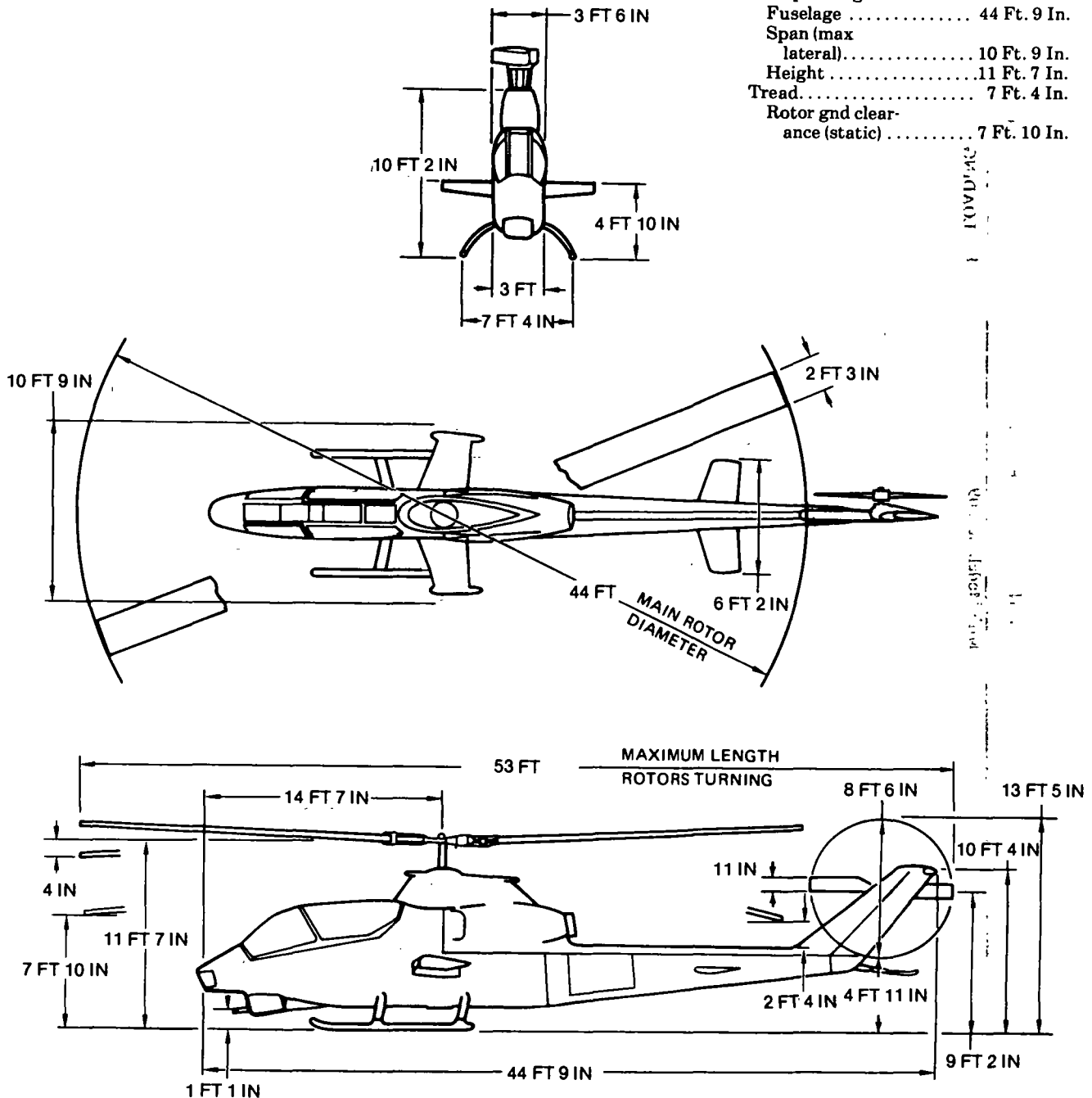


Figure 1-3. Principal Dimensions AH-1S (mod)

1-9. AH-1S (MOD) Characteristics

ENGINE				MISSION AND DESCRIPTION		WEIGHTS	
No. and Model..... (1) T53-L-703 Mfr..... Lycoming Engine Spec. No..... 104.43 Type..... Free Power Turbine Reduction Gear Ratio..... 0.3115 Tail Pipe..... Fixed Area Augmentation..... None				Mfr's Model: Bel 209 The primary mission of this aircraft is anti-arbor; providing a stable airborne platform for the tube launched, optically tracked, wire guided missile (TOW) helicopter support. The aircraft is capable of performing this mission from prepared or unprepared areas, under day and night VFR conditions within a temperature range of -25°F to +125°F. The gas turbine powered "Cobra TOW" of compact design featuring tandem seating to give both pilot and gunner nearly unlimited visibility. Both crew stations have flight control and fire control systems permitting flexibility in division of functions under all normal and emergency situations.		LOADING LB. Empty 6,479 (C) Combat Clean 9,364 (C) Scout 10,000 (C) Light Anti-Armor 9,639 (C) Heavy Anti-Armor 9,975 (C) Max Takeoff 10,000 Max Landing 10,000 (C) Calculated	
ENGINE RATINGS				A mission designed fuselage coupled with the 540 roto system gives a low vibration level plus increased maneuverability and speed. Four wing stores stations and an integral chin turret provide a high degree of armament versatility with the capability of quickly changing a wide combination of weapons to match the desired mission. Reliability and maintainability are ensured through the use of many UH-1 parts which have been combat proven. Other features include a crashworthy fuel system with closed circuit refueling capability, and a tractor tailrotor system, TOW missile subsystem and helmet sight fire control subsystem.		FUEL AND OIL	
SEA LEVEL	SHIP	RPM	MIN			Fuel: Grade..... JP-4/5 Spec..... MIL-T-5624 No. tanks..... 2 Location..... Fuselage Qty..... 262 gal. Oil: Spec..... MIL-L-7808/ MIL-L-23699 No. tanks..... 1 Location..... Fuselage Qty..... 3.4 gal.	
Military	1485	6600	30	TECHNICAL PUBLICATIONS		AVIONICS / ARMAMENT	
Normal	1300	6600	Cont.			Refer to chapter 2.	
AIRFRAME: TM55-1500-339-5 T55-1500-220-PM TM55-1520-234-10 & 10CL TM55-1520-234-23 TM55-1520-234-MTF TM55-1520-234-23P TM55-1520-234-PMS ENGINE: TM55-2840-229-24 TM55-2840-247-23P				DEVELOPMENT		FLYAWAY COSTS / NSN	
				Development Contract..... May 1974 Production contract..... Dec. 1974 First Prod. Del..... May 1976		NSN 1520-00504-9112 Lin K29694 COSTS \$575,000	
				FEATURES	PERSONNEL		
				Advanced flexible gun turret. Armor protection for crew and critical components. Hardpoints for rockets, and external stores on wings. Stability Control Augmentation System (SAS) eliminates stabilizer bar and provides a stable gun platform. Helmet Sight Subsystem TOW Missile Subsystem	Anti-Armor Mission Pilot..... 1 Co-Pilot/Gunner ... 1 Ferry Mission Pilot..... 1 Copilot..... 1		

NOTE: Remainder of AH-1Q Models to be converted to AH-1S Models by December 1978.

DIMENSIONS

Rotor dia	44 Ft.
Length:	
Rotors	
operating	53 Ft.
Fuselage	44 FT 7 IN.
Span (max	
lateral)	10 Ft. 8 In.
Height	11 Ft. 7 In.
Tread	7 Ft. 4 In.
Rotor gnd clear-	
ance (static)	7 Ft. 10 In.

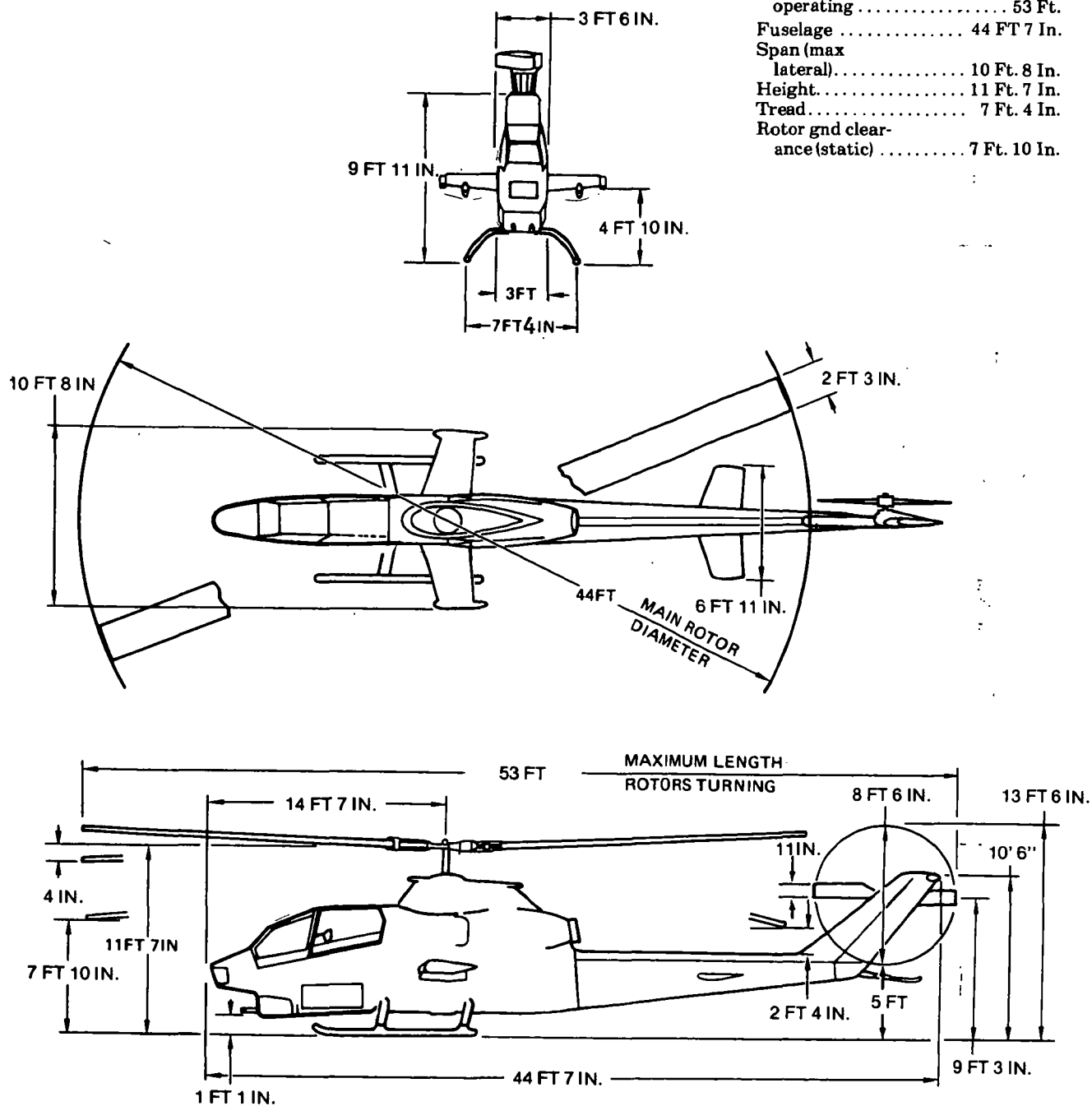


Figure 1-4. Principal Dimensions AH-1S (Prod)

1-10. AH-1S (Prod) Characteristics

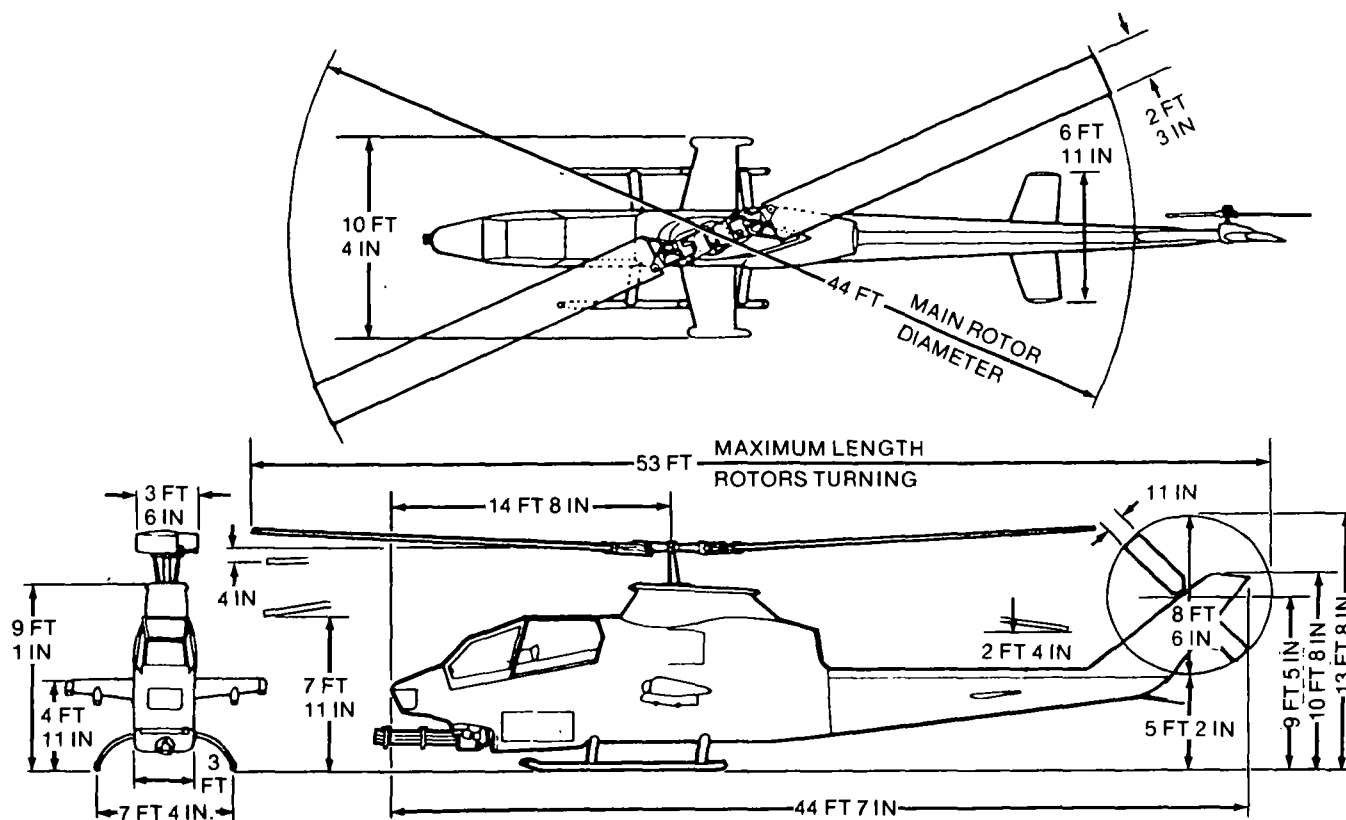
ENGINE			MISSION AND DESCRIPTION		WEIGHTS	
No. and Model (1) T53-L-703 ¹ Mfr Lycoming Engine Spec. No. 104.43 Type Free Power Turbine Reduction Gear Ratio 0.3115 Tail Pipe Fixed Area Augmentation None			Mfr's Model: Bel 209 The primary mission of this aircraft is anti-tank, providing a stable airborne platform for the tube launched, optically tracked, wire guided missile (TOW) helicopter support. The aircraft is capable of performing this mission from prepared or unprepared areas, under day and night VFR conditions within a temperature range of -25°F to +125°F. The gas turbine powered "Cobra-TOW" of compact design featuring tandem seating to give both pilot and gunner nearly unlimited visibility. Both crew stations have flight control and fire control systems permitting flexibility in division of functions under all normal and emergency situations. A mission designed fuselage coupled with the 540 roto system gives a low vibration level plus increased maneuverability and speed. Four wing stores stations and an integral chin turret provide a high degree of armament versatility with the capability of quickly changing a wide combination of weapons to match the desired mission. Reliability and maintainability are ensured through the use of many UH-1 parts which have been combat proven. Other features include a crashworthy fuel system with closed circuit refueling capability, and a tractor tailrotor system, TOW missile subsystem and helmet sight fire control subsystem.		LOADING LB. Empty 6,479 (C) Combat Clean 9,364 (C) Scout Light Anti-Armor 9,639 (C) Heavy Anti-Armor 9,975 (C) Max Takeoff 10,000 Max Landing 10,000 (c) Calculated	
ENGINE RATINGS					FUEL AND OIL	
SEA LEVEL	SHIP	RPM MIN			Fuel: Grade JP-4/5 Spec. MIL-T-5624 No. tanks 2 Location Fuselage Qty 262 gal. Oil: Spec. MIL-L-7808/ MIL-L-23699 No. tanks 1 Location Fuselage Qty 3.4 gal.	
Military	1400	6600 30				
Normal	1250	6600 Cont.				
TECHNICAL PUBLICATIONS			DEVELOPMENT			
AIRFRAME: TM55-1500-339-5 TM55-1500-220-PM TM55-1520-236-MTF TM55-1520-236-23P TM55-1520-236-PMS ENGINE: TM55-2840-229-24 TM55-2840-247-23P			Development Contract Jan 1975 Production contract Dec 1975 First Prod. Del. Mar 1977			
			FEATURES	PERSONNEL	AVIONICS / ARMAMENT	
			Advanced flexible gun turret. Armor protection for crew and critical components. Hardpoints for rockets, and external stores on wings. Stability Control Augmentation System (SAS) eliminates stabilizer bar and provides a stable gun platform. Helmet Sight Subsystem TOW Missile Subsystem	Anti-Armor Mission Pilot 1 Co-Pilot/Gunner 1 Ferry Mission Pilot 1 Co-Pilot 1	Refer to chapter 2.	
					FLYAWAY COSTS / NSN	
					NSN 1520-00504-9112 Lin K29694. COSTS: Refer To Table 4-3, Page 4-4.	

1-11. Loading and Performance — Typical Mission AH-1S (MOD) and (PROD)

CONDITIONS	MISSION I SCOUT	MISSION II LIGHT ANTI-ARMOR	MISSION III HEAVY ANTI-ARMOR	MISSION IV FERRY (CLEAN)
TAKEOFF WEIGHT.....(lb)	10,000	9,639	9,975	9,364
Fuel at 6.5 lbs/gal (Grade JP-4).....(lb)	1,287	1,684	1,684	1,684
Payload.....(lb)	3961	3216	3432	2875
Takeoff Power Loading.....(lb SHP)	7.75	7.47	7.73	7.25
Disk Loading.....(lb sq ft)	6.58	6.34	6.56	6.16
Autorotation Speed (Min R/D).....(kn)	65	65	65	65
Takeoff Ground Run at SL.....(ft)	0	0	0	0
Takeoff to Clear 50 ft.....(ft)	0	0	0	0
Vertical Rate of Climb at SL.....(fpm)	320	610	335	850
Maximum Rate of Climb at SL.....(fpm)	1,620	1,740	1,640	1,850
Speed for Max R/C at SL.....(kn)	64	65	65	60
Time: SL to 5000 ft.....(min)	3.1	2.8	3.0	2.7
Time: SL to 10,000 ft.....(min)	8.6	5.7	6.1	5.4
Service Ceiling (100 fpm).....(ft)	12,200	14,800	12,300	15,000
Absolute Hovering Ceiling.....(ft)	11,600	8,000	3,800	10,200
COMBAT RANGE.....(nmi)	—	—	—	320
Average Cruise Speed.....(kn)				130
Cruising Altitude (Initial).....(ft)				10,000
Cruising Altitude (Final).....(ft)				10,000
Total Mission Time.....(hr)				2.6
COMBAT RADIUS.....(nmi)				
Average Cruise Speed.....(kn)				
Cruising Altitude (Outbound) (Min/Max).....(ft)				
Cruising Altitude (Inbound).....(ft)				
Total Mission Time.....(hr)	1.4	2.1	2.0	2.4

DIMENSIONS

Rotor dia.....	44 ft
Length:	
Rotors	
operating	53 ft.
Fuselage	44 ft. 7 in.
Span (max lateral).....	10 ft. 4 in.
Height	12 ft. 1 in.
Tread	7 ft. 4 in.
Rotor gnd clearance (static).....	7 ft. 11 in.



209947-9D

Figure 1-5. Principal dimensions AH-1S (ECHS).

1-12 AH-1S (ECAS) ^{1/} Characteristics

FM101-20

ENGINE			MISSION AND DESCRIPTION		WEIGHTS	
No. and Model..... (1) T53-L-703 Mfr.....Lycoming Engine Spec. No..... 104.43 Type..... Free Power Turbine Reduction Gear Ratio..... 0.3115 Tail Pipe..... Fixed Area Augmentation..... None			Mfr's Model: Bel 209 The primary mission of this aircraft is anti-armor, providing a stable airborne platform for the tube launched, optically tracked, wire guided missile (TOW) helicopter support. The aircraft is capable of performing this mission from prepared or unprepared areas, under day and night VFR conditions within a temperature range of -25°F to +125°F. The gas turbine powered "Cobra TOW" of compact design featuring tandem seating to give both pilot and gunner nearly unlimited visibility. Both crew stations have flight control and fire control systems permitting flexibility in division of functions under all normal and emergency situations.		LOADING LB. Empty 6,580 (C) Combat Clean 9,541 (C) Scout 10,000 (C) Light Anti-Armor 9,661 (C) Heavy Anti-Armor 9,987 (C) Max Takeoff 10,000 Max Landing 10,000 (c) Calculated	
ENGINE RATINGS			A mission designed fuselage coupled with the 540 roto system gives a low vibration level plus increased maneuverability and speed. Four wing stores stations and an integral chin turret provide a high degree of armament versatility with the capability of quickly changing a wide combination of weapons to match the desired mission. Reliability and maintainability are ensured through the use of many UH-1 parts which have been combat proven. The AH-1S (ECAS) has a crashworthy fuel system with closed circuit refueling capability, and a tractor tailrotor system.		FUEL AND OIL	
SEA LEVEL	SHIP	RPM MIN			Fuel: Grade..... JP-4/5 Spec..... MIL-T-5624 No. tanks..... 2 Location..... Fuselage Qty..... 262 gal. Oil: Spec..... MIL-L-7808/ MIL-L-23699 No. tanks..... 1 Location..... Fuselage Qty..... 3.4 gal.	
TECHNICAL PUBLICATIONS			DEVELOPMENT		AVIONICS / ARMAMENT	
AIRFRAME: TM55-1520-236-10 & 10CL TM55-1520-236-23 TM55-1520-236-MTF TM55-1520-236-23P TM55-1520-236-PMS ENGINE: TM55-2840-229-24 TM55-2840-247-23P			Development contract Jan 1977 Production contract Jun 1977 First Prod. Del..... Sep 1978		Refer to chapter 2.	
			FEATURES ^{2/}	PERSONNEL	FLYAWAY COSTS / NSN	
			Armor protection for crew and critical components. Hardpoints for rockets, and external stores on wings. Stability Control Augmentation System (SAS) eliminates stabilizer bar and provides a stable gun platform. Helmet Sight Subsystem TOW Missile Subsystem XM138 RMG XM97E1 Turret Subsystem 10 KUA Alternator	Anti-Armor Mission Pilot..... 1 Co-Pilot/Gunner 1 Ferry Mission Pilot..... 1 Co-Pilot 1	NSN 1520-00504-9112 Lin K29694, COSTS: Refer to Table 4-3, Page 4-5.	

NOTES:

1/ AH-1S (ECAS) will be deployed to TO&E units beginning in Jan 79.

2/ AH-1S (ECAS) will initially be fielded without the XM138 rocket management subsystem (RMS). Estimate field retrofit to begin during the Nov/Dec 79 time frame.

1-13. Loading and Performance — Typical Mission AH-1S (ECAS)

CONDITIONS	MISSION I SCOUT	MISSION II LIGHT ANTI-ARMOR	MISSION III HEAVY ANTI-ARMOR	MISSION IV FERRY (CLEAN)
TAKEOFF WEIGHT..... (lb)	10,000	9,661	9,987	9,541
Fuel at 6.5 lbs/gal (Grade JP-4)..... (lb)	1,101	1,684	1,532	1,684
Payload..... (lb)	3,461	3,081	3,407	2,961
Takeoff Power Loading..... (lb SHP)	7.75	7.47	7.73	7.25
Disk Loading..... (lb sq ft)	6.58	6.34	6.56	6.16
Autorotation Speed (Min R/D)..... (kn)	65	65	65	65
Takeoff Ground Run at SL..... (ft)	0	0	0	0
Takeoff to Clear 50 ft..... (ft)	0	0	0	0
Vertical Rate of Climb at SL..... (fpm)	320	610	335	850
Maximum Rate of Climb at SL..... (fpm)	1,620	1,740	1,640	1,850
Speed for Max R/C at SL..... (kn)	64	65	65	60
Time: SL to 5000 ft..... (min)	3.1	2.8	3.0	2.7
Time: SL to 10,000 ft..... (min)	8.6	5.7	6.1	5.4
Service Ceiling (100 fpm)..... (ft)	12,200	14,800	12,300	15,000
Absolute Hovering Ceiling..... (ft)	11,600	8,000	3,800	10,200
COMBAT RANGE..... (nmi)	—	—	—	320
Average Cruise Speed..... (kn)				130
Cruising Altitude (Initial)..... (ft)				10,000
Cruising Altitude (Final)..... (ft)				10,000
Total Mission Time..... (hr)				2.6
COMBAT RADIUS..... (nmi)				
Average Cruise Speed..... (kn)				
Cruising Altitude (Outbound) (Min/Max)..... (ft)				
Cruising Altitude (Inbound)..... (ft)				
Total Mission Time..... (hr)	1.4	2.1	2.0	2.4

1-14. Loading and Performance — Typical Mission AH1S (MOD) (PROD) and (ECAS)

CONDITIONS	MISSION I SCOUT	MISSION II LIGHT ANTI-ARMOR	MISSION III HEAVY ANTI-ARMOR	MISSION IV FERRY (CLEAN)
COMBAT WEIGHT.....(lb)	9,500	9,140	9,400	8,600
Combat Altitude.....(ft)	Sea Level	Sea Level	Sea Level	10,000
Combat Speed.....(kn)	0 to 130	0 to 130	0 to 130	140
Combat Climb.....(fpm)	1,800	1,800	1,800	2,000
Combat Ceiling (500 ft/min).....(ft)	—	—	—	—
Service Ceiling (100 ft/min).....(ft)	14,800	16,000	14,800	19,000
Absolute Hovering Ceiling.....(ft)				
Takeoff Ground Run at SL.....(ft)	0	0	0	0
Takeoff to Clear 50 ft.....(ft)	0	0	0	0
Maximum Rate of Climb at SL.....(fpm)	1,800	1,800	1,800	2,000
Speed for Max R/C at SL.....(kn)	64	64	64	64
Max Speed at SL.....(kn)	140	140	140	140
Basic Speed at 5000 ft.....(kn)	140	140	140	140
LANDING WEIGHT.....(lb)	8,513	7,923	8,043	7,864
Ground Roll at SL.....(ft)	0	0	0	0
Total from 50 ft.....(ft)	0	0	0	0

1-15. Performance Notes, AH-1S (Hueycobra).**LIGHT SCOUT MISSION – Armed Tactical Helicopter – Radius**

Start engine; warm-up, takeoff, and climb on course at normal power to 6350 feet initial cruise altitude. Maintain 55-feet-per-minute rate of climb at cruise speed to an altitude of 9800 feet. Descend to sea level and fire rockets during a period of ten (10) minutes combat at normal power. Climb on course to 10,000 feet at normal power and return to home base at cruise speed. Range free allowances are two (2) minutes of normal power for warm-up and takeoff, ten (10) minutes of combat time at normal power, plus ten percent of initial fuel for landing and reserve.

HEAVY SCOUT MISSION – Armed Tactical Helicopter – Radius

Start engine, warmup, takeoff, and climb on course at normal power to 5350 feet initial cruise altitude. Maintain 41.6 feet-per-minute rate of climb at cruise speed to an altitude of 7250 feet. Descend to sea level and fire rockets during a period of ten (10) minutes combat at normal power. Climb on course to 10,000 feet at normal power and return to home base at cruise speed. Range free allowances are two (2) minutes of normal power for warm-up and takeoff, ten (10) minutes of combat time at normal power, plus ten percent of initial fuel for landing and reserve.

HOG MISSION – Armed Tactical Helicopter – Radius

Start engine, warm-up, takeoff, and climb on course at normal power to 5600 feet initial cruise altitude. Maintain 50-feet-per-minute rate of climb at cruise speed to an altitude of 7200 feet. Descend to sea level

and fire rockets during a period of ten (10) minutes combat at normal power. Climb on course to 10,000 feet at normal power and return to home base at cruise speed. Range free allowances are two (2) minutes of normal power for warm-up and takeoff, ten (10) minutes of combat time at normal power, plus ten percent of initial fuel for landing and reserve.

FERRY MISSION – Clean (Without Auxiliary Tanks) – Range

Start engine, warm-up, takeoff, and climb on course at normal power to 10,000 feet initial cruise altitude. Fly out at cruise speeds until ninety percent of initial fuel is consumed and land at remote base. Range free allowance include two (2) minutes at normal rated power for warm-up and takeoff, and ten percent of initial fuel for landing and reserve.

GENERAL NOTES:

- a. Cruise speed as used above denotes airspeed for long-range operation and is the greater of the two speeds at which ninety-nine percent of the maximum miles per pound of fuel are attainable at the momentary weight and altitude.
- b. Data do not include ground effect.

PERFORMANCE BASIS:

- a. Power required is based upon "Engineering Phase B Flight-Test Data".
- b. Power available and fuel flow are based on Lycoming Model Specification No. 104.33, and includes particle separators and filters.

NOTE: AH-1Q Deleted Since Conversion to AH-1S Models is Scheduled for Completion by December 1978.

NOTE: Performance Notes Not Available for AH-1S Models.

Source: DRCPM-CO



Figure 1-6. CH-47A, B, C and D (Chinook), typical (minor differences apparent between A, B, C and D models).

DIMENSIONS

Rotor dia	59 Ft. 1-1/4 In.
Length:	
Rotor	
operating	97 Ft. 6-1/2 In.
Rotors folded	51 Ft.
Fuselage	51 Ft.
Height	18 Ft. 6-1/2 In.
Tread	11 Ft. 11 In.
Main rotor gnd clearance:	
Idling (fwd)	10 Ft. 11 In.
(aft)	18 Ft. 6-1/2 In.
Static (fwd)	7 Ft. 8 In.
(aft)	17 Ft. 11 In.

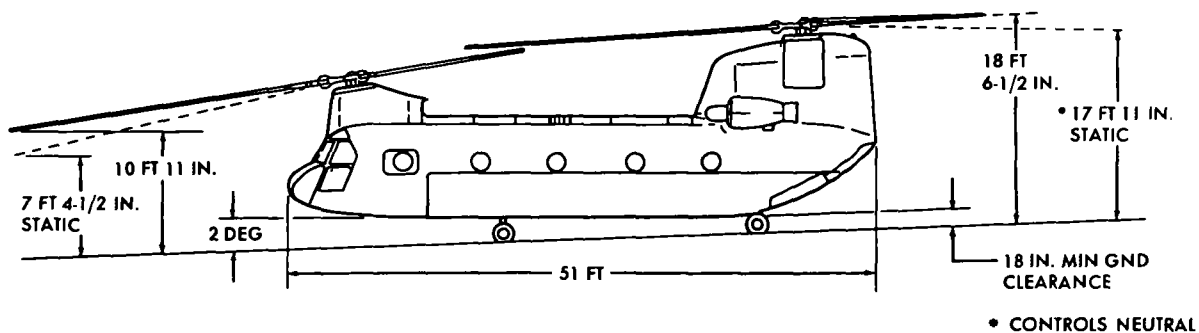
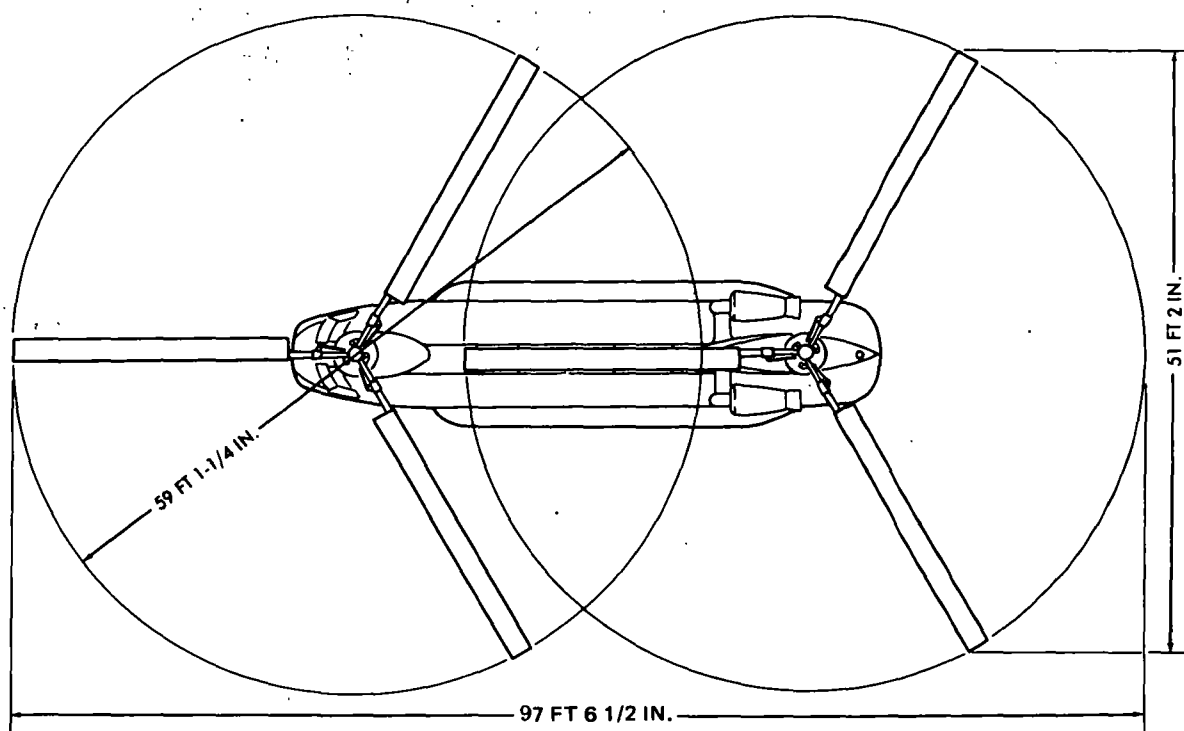
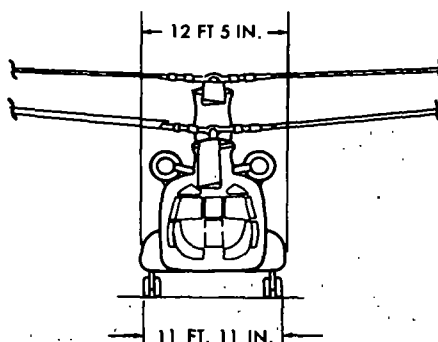


Figure 1-7. Principal Dimensions, CH-47A (Chinook)

1-16. CH-47A (Chinook) Characteristics.

ENGINE		MISSION AND DESCRIPTION		WEIGHTS	
No. & model ..(2) T55-L-7B Mfr Lycoming Engine spec No .. T55-L-7/7B 124.20-A T55-L-7C 124.31		Mfr's Model: Vertol The principal mission of the CH-47A helicopter is the transport of cargo, troops, and equipment within the combat area. In addition, this helicopter is suitable for special support functions. It is suitable for operations during day, night, visual, and instrument conditions. The CH-47A helicopter is a twin-turbine-engine, tandem rotary-wing aircraft. It is powered by two Lycoming T55-L-7 shaft turbine engines mounted on the aft fuselage. The engines simultaneously drive two tandem three-bladed rotary wings through a combining transmission, drive shafting, and reduction transmission. The forward transmission is mounted in the pylon above the cockpit. The aft transmission, the combining transmission, and drive shafting are located in the aft pylon section. A gas-turbined auxiliary power unit, used for starting the engines, is mounted in the aft pylon section. Pods on the sides of the fuselage contain fuel tanks. The helicopter is equipped with nonretractable quadricycle landing gear. The aft wheels are full-swivel type. The entrance door is located at the forward right side of the cabin fuselage section. At the rear of the cabin fuselage section is a hydraulically powered loading ramp. A 16,000 pound cargo hook assembly is provided for transporting external loads. Cargo compartment capacity same for all models (1450 cubic ft.)		LB L.F. Empty (SPFG) .. 18,084 Design gross wt .. 28,550 2.67 Max alt gross wt . 33,000 2.00 Max takeoff ... 33,000 2.00 Max landing ... 33,000 2.00	
ENGINE RATINGS		<th colspan="2">FUEL AND OIL</th>		FUEL AND OIL	
SHP RPM ALT MIN				Fuel: Grade JP-4 Spec MIL-T-5624 No. tanks: Nacelle (2) 621 gal (50 percent self-sealing) 630 gal (non-self-sealing) 573 gal (crash resistant) Oil: Spec Temps above 25°F MIL-L-23699 Temps below 25°F MIL-L-7808 No. tanks 2 Location Integral with engine Qty 7 gal	
T55-L-7				AVIONICS / ARMAMENT Refer to chapter 2. FLYAWAY COSTS / NSN CH-47A, NSN 1520-00633-6836, Line K30378, COST \$990,717	
Military 2650 15,150 SL 30					
Normal 2200 15,000 SL Cont.					
T55-L-7B					
Military 2650 15,800 SL 30					
Normal 2200 15,000 SL Cont.					
T55-L-7C		DEVELOPMENT Date of contract 27 June 1960 First flight 6 September 1961 Production status Completed May 1967			
Max 2850 16,000 SL 10					
Military 2650 15,750 SL 30					
Normal 2400 15,350 SL Cont.					
T55-L-7C					
Max 2850 16,000 SL 10					
Military 2650 15,750 SL 30					
Normal 2400 15,350 SL Cont.					
TECHNICAL PUBLICATIONS		CAPACITIES		PERSONNEL	
AIRFRAME: TM55-1520-209-10 TM55-1520-209-23 TM55-1520-209-23P TM55-1520-209-PMS DMWR 55-1500-210 ENGINE: TM55-2840-234-24/1 TM55-2840-234-23P DMWR 55-2840-106		Cargo compartment:		Crew (normal) 4	
		Floor 228-3/4 sq ft		Troops 33	
		Length 30 ft, 6 in.		Litters 24	
		Width 7 ft, 6 in.			
		Height 6 ft, 6 in.			
		Volume 1487 cu ft			
Forward door:					
Height 5 ft, 6 in.					
Width 3 ft					
Cargo ramp door:					
Length 6 ft, 6 in.					
Width 7 ft, 6 in.					

1-17. Loading and Performance — Typical Mission, CH-47A (Chinook).

CONDITIONS	MISSION	MISSION	MISSION FERRY
	I	II	III
Gross weight (lb) . . .	28,262	33,000	33,000
Weight empty (lb) . . .	17,932	18,112	17,552
Payload (lb) . . .	6000	13,400	---
Radius of action (nmi) . . .	100	20	---
Ferry range (nmi) . . .	---	---	866
Cruise altitude (ft) . . .	SL	SL	6000
Cruise speed (kn) . . .	130	110	110
V _{Max} @ SL military power (kn) . . .	130	110	110
V _{Max} @ SL normal power (kn) . . .	130	110	110
V _{Max} @ 5000 ft, normal power (kn) . . .	114	94	94
Hover ceiling OGE 95°F, military power, std atmosphere (ft) . . .	6000	7900	7900
Hover ceiling IGE military power, std atmosphere . . (ft) . . .	11,900	9200	9200
Service ceiling			
Normal power (ft) . . .	11,900	9200	9200
Military power 1 eng out (ft) . . .	6000	1400	1400
R/C Max — military power — SL (ft/min) . . .	2750	2160	2166

1. All performance based on NASA standard atmosphere unless otherwise noted.
2. V_{Max} reflects airspeed limitations specified in TM55-1520-209-10.
3. CH-47A model specifications 114-X-601.

1-18. Performance Notes, CH-47A (Chinook).**FORMULA: MISSION I**

Deliver 6000-pound internal payload to any point 100 nautical miles and return with 3000-pound internal payload. Cruise at sea level. Land with 10 percent of initial fuel reserve.

FORMULA: MISSION II

Deliver 13,400-pound external payload to any point 20 nautical miles and return. Equivalent flat

plate of external cargo = 26 sq ft. Cruise at sea level. Return with fuel reserve for 10-minute cruise at return gross weight.

FORMULA: MISSION III

Ferry Range of 866 nautical miles. Land with 10 percent of initial fuel reserve. Climb to 6000 feet, 256 nautical miles. Cruise 6000 feet for 610 nautical miles. Total ferry time: 7 hours, 50 minutes.

Source: DRSTS-WC

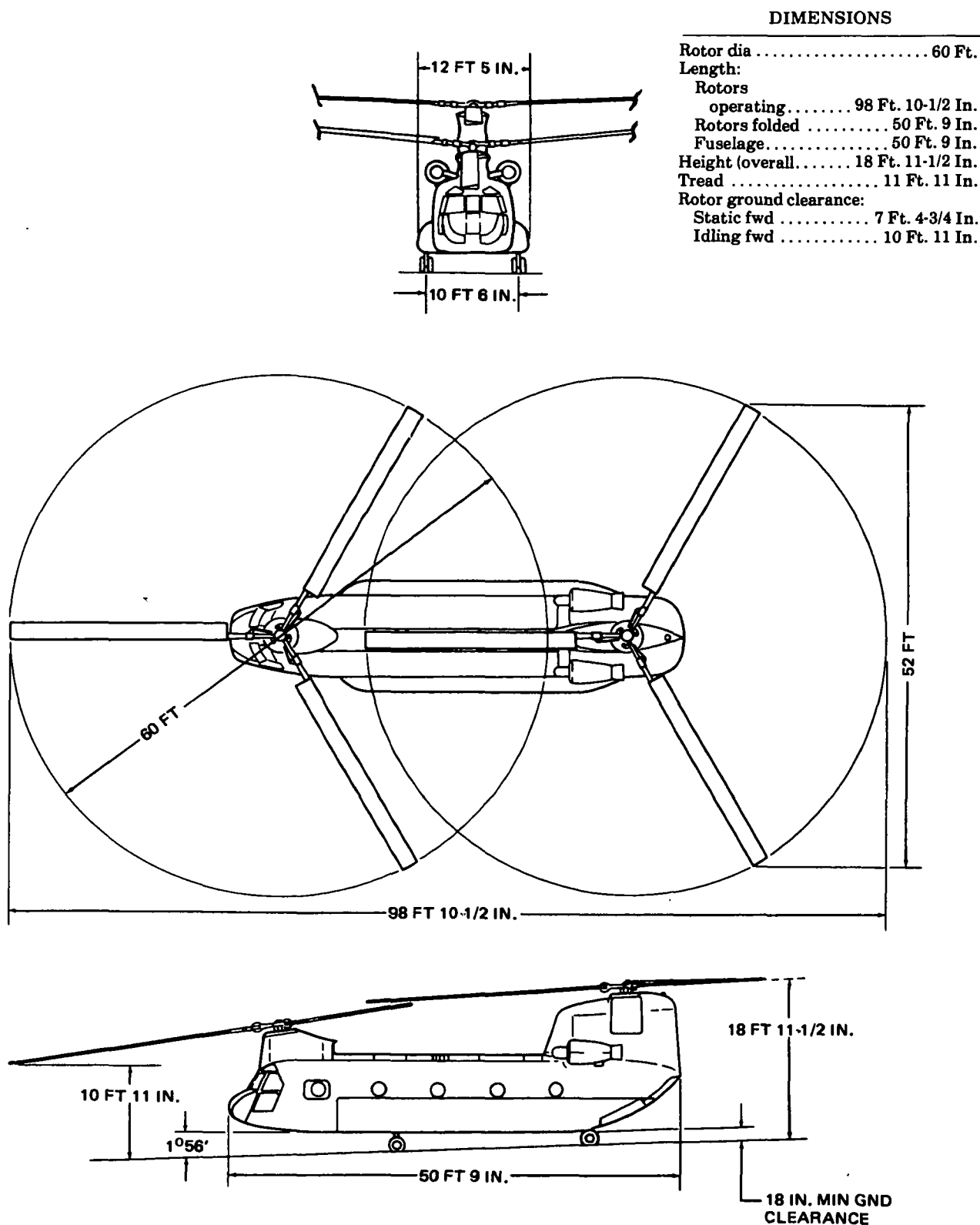


Figure 1-8. Principal Dimensions, CH-47B and C (Chinook)

1-19. CH-47B (Chinook) Characteristics.

ENGINE	MISSION AND DESCRIPTION	WEIGHTS
No. & Model (2) T55-L-7C Mfr Lycoming Engine spec No. T55-L-7C 124.31 Engine /rotor gear ratio 65.93:1	Mfr's Model: Vertol The principal mission of the CH-47B helicopter is to provide air transportation for troops and cargo. The aircraft can also be utilized for rescue of personnel. The CH-47B is a large tandem rotor helicopter with built-in accommodations for 24 litter patients and 2 attendants or 33 troops and troop commander. The helicopter is equipped with an unobstructed 30-foot long cargo compartment with straight-in rear loading and has a capacity of over 450 cubic feet. Other features include an external cargo hook of 10-ton capacity and a winch system for loading an auxiliary power unit which powers the utility hydraulic system, thus eliminating the requirement for external ground power sources; stability system provided through Vertol SAS; and provisions for utilizing collapsible fuel tanks to increase the fuel capacity by 2000 gallons. The complete helicopter is designed for operations in temperatures ranging from -25° F to +125°F.	LB L.F. Empty *19,153 Basic *19,194 Design 33,000 3.00 Combat *21,734 Max alternate gross weight ... 40,000 2.54 Normal takeoff .. 33,000 3.00 Alternate takeoff . 40,000 2.54 Max landing 40,000 2.54 *For basic mission.
ENGINE RATINGS	DEVELOPMENT	FUEL AND OIL
SHP RPM ALT MIN Maximum 2850 16000 SL 10 Military 2650 15750 SL 30 Normal 2400 15350 SL Cont	Date of contract June 1966 First flight October 1966 Production status Completed February 1968	Fuel: Grade JP-4 Spec MIL-T-5624 No. tanks: Fuselage (2) 621 gal 566 gal (crash resistant) Oil: Engine contained oil supply Spec Temps above 25°F. MIL-L-23699 Temps below 25°F. MIL-L-7808 Qty 7 gal
TECHNICAL PUBLICATION	CAPACITIES	PERSONNEL
AIRFRAME: TM55-1520-227-10/1 TM55-1520-227-23 TM55-1520-227-23P TM55-1520-227-PMS DMWR 55-1500-210 ENGINE: TM55-2840-234-24/1 TM55-2840-234-23P DMWR 55-2840-106	Cargo compartment: Floor 228-3/4 sq ft Length 30 ft, 6 in. Width 7 ft, 6 in. Height 6 ft, 6 in. Volume 1487 cu ft Forward door: Height 5 ft, 6 in. Width 3 ft Cargo ramp door: Height 6 ft, 6 in. Width 7 ft, 6 in.	Crew 4 Litters 24 or Troops 33
		AVIONICS / ARMAMENT Refer to chapter 2. FLYAWAY COSTS / NSN CH-47B, NSN 1520-00990-2941 LINE K30383, COST \$1,063,448

1-20. Loading and Performance — Typical Mission, CH-47B (Chinook)

CONDITIONS	BASIC MISSION I	BASIC MISSION (DESIGN GW) II	PRIMARY MISSION III	EXTERNAL PAYLOAD MISSION IV	MAXIMUM FERRY MISSION V
Estimated gross weight (lb.) . .	30,900	33,000	40,000	40,000	40,000
Payload guaranteed (outbound) (lb.) . .	6,000	-	-	-	-
Payload guaranteed (inbound) (lb.) . .	3,000	-	-	-	-
Payload estimated (outbound) (lb.) . .	7,000	9,000	15,900	18,800	1,075
Payload estimated (inbound) (lb.) . .	3,500	4,500	7,935	0	-
V _{max} at SL/STD, military power (kn) . .	168 ^{2/}	165 ^{2/}	145 ^{2/}	138 ^{1/2/}	145 ^{2/}
Max cruise speed at SL/STD, normal power,					
Guaranteed (kn) . .	-	150	-	-	-
Estimated (kn) . .	166	163	142	132 ^{1/}	142
V-Cruise (best range) at SL/STD (kn) . .	145	144	134	100 ^{3/}	134
V-Cruise (best range) at 5000 F (kn) . .	138	134	114	100	114
Max rate-of-climb at SL/STD military power (ft/min) . .	2,440 ^{2/}	2,200 ^{2/}	1,520 ^{2/}	1,440	1,520
Vertical rate-of-climb at SL/STD, maximum power (ft/min) . .	2,300 ^{2/}	1,800 ^{2/}	60	60	60
Service ceiling at normal power (ft) . .	18,000	16,200	9,550	8,950	9,550
Service ceiling, single engine at military power					
Guaranteed (ft) . .	6,000	-	-	-	-
Estimated (ft) . .	6,050	3,650	-	-	-
Hover ceiling, OGE at STD temperature maximum power (ft) . .	12,850	10,650	700 ^{2/}	700 ^{2/}	700 ^{2/}
Hover ceiling, IGE at STD temperature maximum power, 10 ft wheel height (ft) . .	16,300	14,200	7,400	7,400	7,400
Radius of action					
Guaranteed (nmi) . .	100	-	-	-	-
Estimated (nmi) . .	100	100	95	20	-
Ferry range (nmi) . .	-	-	-	-	1,090

1-20. Loading and Performance — Typical Mission, CH-47B (Chinook) (CONT).

NOTES:

1/With external payload equivalent to 26 Sq. Ft. drag area.

2/Transmission limit.

3/Mission cruise speed.

The above table reflects performance capability only. For approved operational limits which consider all pertinent factors, see TM 55-1520-209-10.

For Mission I the helicopter shall be capable of hovering at 6000 ft. for ten minutes at 95°F, OGE at the gross weight required for the accomplishment of Mission I (guaranteed). The Mission I gross weight includes an outbound payload of 6000 lb., return payload of 3000 lb., and fuel for a radius of 100 nmi.

During Mission III the helicopter shall be capable of hovering out-of-ground effect at sea level standard, maximum power and at a gross weight of 39,500 pounds (guaranteed).

1-21. Performance Notes, CH-47B (Chinook).

FORMULA: RADIUS MISSIONS I & II

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds to remote base, land, and unload cargo. Without refueling, warm up, take off, climb on course to 5000 feet at normal power, and return at long range speeds. Range-free allowances are 2 minutes of normal power for each warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, cruise out at long range speeds at sea level to remote base, land, and unload outbound cargo, load inbound cargo. Without refueling, warm up, take off, return at long range speeds at sea level, land, and unload cargo. Range-free allowances are 2 minutes of normal power for each warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION IV

Warm up, take off, cruise out at 100 knots at sea level with external cargo to remote base, detach cargo, and land. Without refueling, warm up, take off, and return at long range speeds at sea level. Range-free allowances are 2 minutes of normal power for each warmup and takeoff, plus 10 minutes of cruise fuel for reserve.

FORMULA: RANGE MISSIONS I & II

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds until 90 percent of initial fuel is consumed, land, and unload cargo. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Warm up, take off, cruise out at long range speeds at sea level until 90 percent of initial fuel is consumed, land, and unload cargo. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION IV

Warm up, take off, cruise out at 100 knots at sea level with external cargo until 10 minutes of cruise fuel remains, detach cargo, and land. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 minutes of cruise fuel for reserve.

FORMULA: RANGE MISSION V

Warm up, take off, climb on course to optimum cruise altitude at cruise speed, cruise out at long range speeds until 90 percent of initial fuel is consumed. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

PERFORMANCE REFERENCES

Vertol Report 114-PJ-602. Detail Specifications for the Model CH-47B Helicopter.

Boeing-Vertol Report 114-AD-601. Estimated Performance Capability of CH-47B and CH-47C Helicopters.

Lycoming Model Specification 124.31, T55-L-7C Shaft Turbine Engine.

Source: DRSTS-WC

1-22. CH-47C (Chinook) Characteristics.

ENGINE	MISSION AND DESCRIPTION	WEIGHTS
No. & model (2) T55-L-11A Mfr Lycoming Engine spec No .. 124.38 Engine/Rotor gear ratio 64.05:1	Mfr's Model: Vertol The principal mission of the CH-47C is to provide air transportation for troops and cargo. The aircraft can also be utilized for rescue of personnel. The CH-47C is a large tandem rotor helicopter with built-in accommodations for 24 litter patients and 2 attendants or 33 troops and troop commander. The helicopter is equipped with an unobstructed 30-foot long cargo compartment with straight-in rear loading and has a capacity of over 1450 cubic feet. Other features include an external cargo hook of 10-ton capacity and a winch system for loading an auxiliary power unit which powers the utility hydraulic system, thus eliminating the requirements for external ground power sources; stability system provided through Vertol SAS; and provisions for utilizing collapsible fuel tanks to increase the fuel capacity by 2000 gallons. The complete helicopter is designed for operations in temperatures ranging from -25°F to +125°F.	LB L.F. Empty \$19,723 Basic \$19,772 Design 33,000 3.00 Combat \$23,886 Max alternate gross wt 46,000 2.15 Normal takeoff 33,000 Alternate takeoff 46,000 Max landing 46,000 \$/ For basic mission.
ENGINE RATINGS		
SHP RPM ALT MIN Max ... 3750 16000 SL 10 Mil ... 3400 16000 SL 30 Nor ... 3000 15400 SL Cont		
TECHNICAL PUBLICATIONS	DEVELOPMENT	FUEL AND OIL
Airframe: TM55-1520-227-10/2 TM55-1520-227-23 TM55-1520-227-23P TM55-1520-227-PMS DMWR55-1500-210 Engine: TM55-2840-234-24/2 TM55-2840-234-23P DMWR55-2840-118	Date of contract June 1966 Aircraft in production January 1969	Fuel: Grade JP-4 or JP-5 Spec MIL-T-5624 No. tanks: Fuselage main.. (2) 621 gal 566 gal (crash resistant) Fuselage aux... (4) 520 gal 480 gal (crash resistant) Qty 1141 gal Oil: Engine contained oil supply Spec Temps above 25° F MIL-L-23699 Temps below 25° F MIL-L-7808 Qty 7 gal
	CAPACITIES	PERSONNEL
	Cargo compartment: Floor 228-3/4 sq ft Length 30 ft, 6 in. Width 7 ft, 6 in. Height 6 ft, 6 in. Volume 1487 cu ft Forward door: Height 5 ft, 6 in. Width 3 ft Cargo ramp door: Height 6 ft, 6 in. Width 7 ft, 6 in.	Crew 4 Troops 33 or Litters 24
		AVIONICS/ARMAMENT
		Refer to chapter 2.
		FLYAWAY COST/NSN
		NSN 1520-00871-7308 Lin / K30499 Costs \$3,223,625

1-23. Loading and Performance — Typical Mission, CH-47C (Chinook).

CONDITIONS	BASIC MISSION I	BASIC MISSION (DESIGN GW) II	PRIMARY MISSION III	EXTERNAL PAYLOAD MISSION IV ^{1/}	MAXIMUM FERRY MISSION V
Gross weight (lb)	39,200 ^{2/}	33,000	46,000	46,000	46,000
Payload guaranteed (outbound) (lb)	12,000	-	-	-	-
Payload guaranteed (inbound) (lb)	6,000	-	-	-	-
Payload estimated (outbound) (lb)	13,300	7,350	19,750	23,300	-
Payload estimated (inbound) (lb)	6,650	3,675	9,875	0	-
V _{max} at SL/STD, military power (kn)	156 ^{4/}	164 ^{3/}	123 ^{5/}	100 ^{5/}	123 ^{5/}
Max cruise speed at SL/STD normal power					
Guaranteed (kn)	-	155	-	-	-
Estimated (kn)	156 ^{4/}	164 ^{3/}	123 ^{5/}	100 ^{5/}	123 ^{5/}
V-Cruise (best range) at SL/STD (kn)	141	140	123 ^{5/}	100 ^{5/}	123 ^{5/}
V-Cruise (best range) at 5000 ft/STD (kn)	136	138	111 ^{4/}	100 ^{5/}	111 ^{4/}
Rate-of-climb at SL/STD military					
power (ft/min)	2,045 ^{3/}	2,880 ^{3/}	1,380 ^{3/}	1,260 ^{3/}	1,380 ^{3/}
Vertical rate-of-climb at SL/STD maximum					
power (ft/min)	1,220 ^{3/}	2,585 ^{3/}	-	-	-
Service ceiling at normal power (ft)	10,200 ^{4/}	15,000 ^{6/}	8,000 ^{4/}	8,000 ^{4/}	8,000 ^{4/}
Service ceiling, STD temp, single engine					
at military power					
Guaranteed (ft)	4,000	-	-	-	-
Estimated (ft)	4,500 ^{2/ 3/}	9,550 ^{2/}	-	-	-
Hover ceiling, OGE at STD temperature,					
max power (ft)	9,600	14,750	-	-	-
Hover ceiling IGE at STD temperature,					
maximum power, 10 ft. wheel height	12,750	15,000	7,600	7,600	7,600
Radius of action,					
Guaranteed (nmi)	100	-	-	-	-
Estimated (nmi)	100	100	100	20	-
Ferry range (nmi)	-	-	-	-	1,226

1-23. Loading and Performance — Typical Mission, CH-47C (Chinook) (CONT).

NOTES:

- 1/ With External Payload Equivalent to 26 FT² Drag Area (Troop Seats Incl.)
- 2/ Hover Gross Weight at 6000 ft/95°F at 245 RPM.
- 3/ Transmission Limit.
- 4/ Structural Envelope.
- 5/ Mission Cruise Speed (Outbound).
- 6/ Current Hydraulic System Limit.
- 7/ At 230 RPM.
- 8/ With 12000 LB Payload.

For Mission I the helicopter shall be capable of hovering at 6000 ft for 10 minutes at 95°F, OGE at gross weight required for accomplishment of Mission I (guaranteed). The Mission I gross weight includes an outbound payload of 12,000 lb., return payload of 6000 lb., and fuel for a radius of 100 nmi.

During Mission III the helicopter shall be capable of hovering out-of-ground effect at SL/STD, maximum power, and a gross weight of 43,000 pounds (guaranteed).

1-24. Performance Notes, CH-47C (Chinook).

FORMULA: RADIUS MISSIONS I & II

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds to remote base, land, and unload cargo. Without refueling, warm up, take off, climb on course to 5000 feet at normal power, and return at long range speeds. Range-free allowances are 2 minutes of normal power for each warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, cruise out at long range speeds at sea level to remote base, land, and unload outbound cargo, load inbound cargo. Without refueling, warm up, take off, return at long range speeds at sea level, land and unload cargo. Range-free allowances are 2 minutes of normal power for each warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION IV

Warm up, take off, cruise out at 100 knots at sea level with external cargo to remote base, detach cargo, and land. Without refueling, warm up, take off, and return at long range speeds at sea level. Range-free allowances are 2 minutes of normal power for each warmup and takeoff, plus 10 minutes of cruise fuel for reserve.

FORMULA: RANGE MISSIONS I & II

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds until 90 percent of initial fuel is consumed, land, and

unload cargo. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Warm up, take off, cruise out at long range speeds at sea level until 90 percent of initial fuel is consumed, land, and unload cargo. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION IV

Warm up, take off, cruise out at 100 knots at sea level with external cargo until 10 minutes of cruise fuel remains, detach cargo, and land. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 minutes of cruise fuel for reserve.

FORMULA: RANGE MISSION V

Warm up, take off, climb on course to optimum cruise altitude at cruise speed, and cruise out at long range speeds until 90 percent of initial fuel is consumed. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

PERFORMANCE REFERENCES

Vertol Report 114-PJ-7003, Detail Specification for The CH-47C Helicopter.

Lycoming Report 124.38, T55-L-11A Engine Specification.

Boeing-Vertol Report 114-AD-601, Estimated Performance Capabilities of CH-47B and CH-47C Helicopters.

Source: DRSTS-WC

DIMENSIONS

Rotor dia	60 Ft.
Length:	
Rotors	
operating	99 Ft. 0 In.
folded	51 Ft. 0 In.
Fuselage	51 Ft. 0 In.
Height (overall)	18 Ft. 7-13/16 In.
Tread	11 Ft. 11 In.
Rotor ground clearance:	
Static fwd	7 Ft. 10-5/8 In.
Idling fwd	11 Ft. 7/8 In.

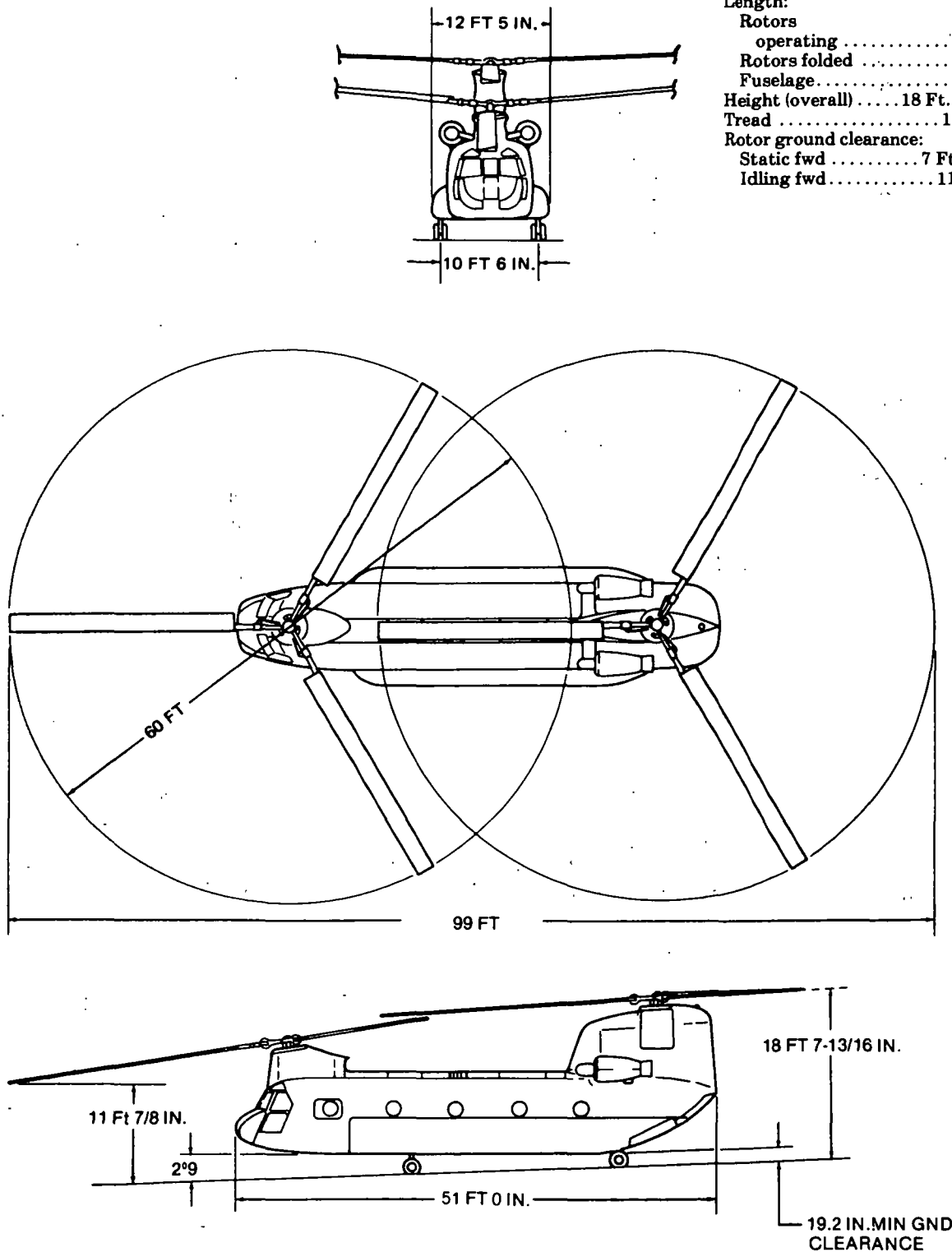


Figure 1-9. Principal Dimensions, YCH-47D (Chinook)

1-25. YCH-47D (Chinook) Characteristics.

ENGINE				MISSION AND DESCRIPTION		WEIGHTS	
No. and Model (2)T55-L-712 Mfg Lycoming Engine Spec. No 124.53 Type Turbohaft Reduction Great Ratio 66.96 Tail Pipe Augmentation				The essential characteristic for the YCH-47D is a minimum lift 15,000 lbs external cargo at 4000', 95°, HOGE with a 200-500 fpm V _R OC and a 30 NM radius. The CH-47 is a medium lift tandem rotor helicopter powered by 2 turbo shaft engines. The helicopter has a 30 ft long cargo compartment with straight-in rear loading with accommodations for 24 litters and 2 attendants or 33 combat equipped troops and troop commander. The helicopter is designed for operations in temperatures ranging from -25° to +125°. The YCH-47D has 3 hooks for transportation of loads externally. The center hook has a capacity of 28,000 lb and the forward and aft hooks each have a 20,000 lb capacity. External loads can be handled separately or rigged for multipoint hook up to improve load stability and increase allowable cruise speed.		LOADING LB. Empty 22784 Basic — Design 33000 Combat Clean — Light Scout — Heavy Scout — Hog — Max. Takeoff 50000 Max. Landing 50000 (C) Calculated • For Basic Mission	
ENGINE RATINGS				DEVELOPMENT		FUEL AND OIL	
SEA LEVEL	RPM			Date of Contact 4 Jun 76		Fuel:	
STD	SHP	MIN		First acft delivered —		Grade JP-4	
Emergency	4500	16000	30			Spec. MIL-T-5624	
Maximum	3750	16000	10			No. tanks 6	
Intermediate	3400	16000	30			Location Fuselage	
Maximum						Qty. 1042 Gal	
Continuous	3000	16000	—			Oil: (Engine)	
TECHNICAL PUBLICATIONS				FEATURES	PERSONNEL	AVIONICS/ARMAMENT	
Airframe:				Cargo Compartment:	Crew 3 Litters 24 (Plus 2 attendants) or Troops 33 (Plus troop commander)	Spec ... MIL-L-23699/7808	
TM55-1520-240-10 and 10CL				Length 30 ft 2 in		No. tanks 1/Eng	
TM55-1520-240-23				Width 7 ft 6 in		Location Internal	
TM55-1520-240-23P				Height 6 ft 6 in		Qty 3.75 Gal ea	
TM55-1520-240-MTF				Forward Door:		FLYAWAY COST/NSN	
TM55-1520-240-PM				Height 5 ft 6 in		LIN Z334 90	
				Width 3 ft 0 in			
Engine:				Cargo Ramp Door:			
TM55-2840-234-24/1				Height 6 ft 6 in			
TM55-2840-234-23P				Width 7 ft 7 in			
DMWR55-2840-118				APU:			
				Solar T-62T-2B			
				Operations:			
				Day, night, VMC, IMC			

1-26. Loading and Performance — Typical Missions YCH-47D (Chinook)

CONDITIONS	MISSION I1/ (ROC)	MISSION II2/	MISSION III3/	MISSION IV4/	FERRY MISSION V5/	DES GW (33000 LB)
Estimated Mission Maximum gross weight (GW) (lb.)	42500	50000	43550	42050	50000	—
Payload guaranteed (outbound) (lb.)	15000	—	13000	—	—	—
Payload guaranteed (inbound) (lb.)	—	—	—	—	—	—
Payload estimated (outbound) (lb.)	15775	22981	14322	15288	—	—
Payload estimated (inbound) (lb.)	—	—	7161	—	—	—
V max at SL/STD, Intermediate power (kn).	—	—	—	—	—	167
Max cruise speed at SL/STD, Maximum continous power,						
Guaranteed (kn).	—	—	—	—	—	155
Estimated (kn).	—	—	—	—	—	162
Ave V-Cruise (outbound) (kn).	111	129	130	105	136	—
Ave V-Cruise (inbound) (kn).	142	135	143	142	—	—
Max rate-of-climb at Mission Max GW (Intermediate power) (ft/min).	755	1430	830	715	1580	3750
Vertical rate-of-climb at Mission Max GW,						(SL)
Take off horsepower (ft/min).	200	740	0	200	825	4200
Service ceiling at maximum continuous power (ft).						(SL)
Service ceiling, single engine at emergency power						15000
Guaranteed (ft).	—	—	—	—	—	10000
Estimated (ft).	—	—	—	—	—	14050
Hover ceiling, OGE at STD temperature						
Take off horsepower (ft).	—	—	—	—	—	15000
Hover ceiling, IGE at STD temperature						
Take off horsepower, 10 ft wheel height (ft).	—	—	—	—	—	15000
Radius of action						
Guaranteed (nmi).	30	—	—	—	—	—
Estimates (nmi).	30	30	100	30	—	—
Ferry range (nmi).	—	—	—	—	1070	—

1-26. Loading and Performance — Typical Missions, YCH-47D (Chinook) Cont'd.

NOTES:

1/ Ambient Conditions: 4000 ft/95°F. External load provides a drag area of 50 sq ft and download of 0.8% GW. This is the Required Operational Capability (ROC) Mission.

2/ Ambient conditions: SL/STD. External load provides a drag area of 50 sq ft and download of 0.8% GW.

3/ Ambient conditions: 4000 ft/95°F.

4/ Ambient conditions: 4000 ft/95°F. External load provides a drag area of 75 sq ft and download of 1.87% GW.

5/ Ambient conditions: Standard atmosphere. Additional ferry fuel is carried in 5 internally mounted auxiliary 600 gal tanks.

Reference: Boeing Vertol Report 145-PJ-7103 Revision D, Detail Specification for Model YCH-47D Helicopter.

1-27. Performance Notes, YCH-47D (Chinook)**Formula: Radius Mission I, II and IV**

Warm up, take-off, hover, acquire external load, climb vertically at maximum power and cruise outbound at long range speed to drop zone. Hover at drop zone to unload cargo and cruise inbound at long range speed. Range free allowances are 2 minutes of maximum continuous power for warm up and take-off, 2 minutes total hover-out-of-ground-effect, 1 minute vertical climb (200 fpm) and 30 minutes reserve at long range cruise speed. This is the Required Operational Capability (ROC) mission profile.

Formula: Radius Mission III

Load cargo internally, warm up, take-off, hover-out-of-ground-effect and cruise outbound to landing zone at long range speed. Land and exchange cargo (inbound load equals $\frac{1}{2}$ outbound load), warm up, take-off, hover-out-of-ground-effect and cruise inbound at long range speed. Range free allowances are 2 minutes of maximum continuous power for each warm up, take-off and hover plus 30 minutes reserve at long range cruise speed.

Formula: Ferry Mission V

Warm up and take-off at sea level and cruise climb to 8000 ft. Cruise at 8000 ft at long range speed to landing zone. Range free allowances are warm up and take-off, 2 minutes at maximum continuous power and a reserve of 10% of initial fuel.

Source: DRCPM-CH47M-T



Figure 1-10. CH-54A and B (Tarhe), typical (minor differences apparent between A and B models)

DIMENSIONS

Main rotor dia	72 Ft.
Length (rotors operating).....	88 Ft. 5 In.
Length (fuselage)	70 Ft. 3 In.
Height (static)	25 Ft. 5 In.
Width (cockpit).....	7 Ft. 1 In.
Tread	19 Ft. 9 In.
Gnd clearance:	
Main rotor (idling)	16 Ft. 8 In.
Tail rotor	9' 4"

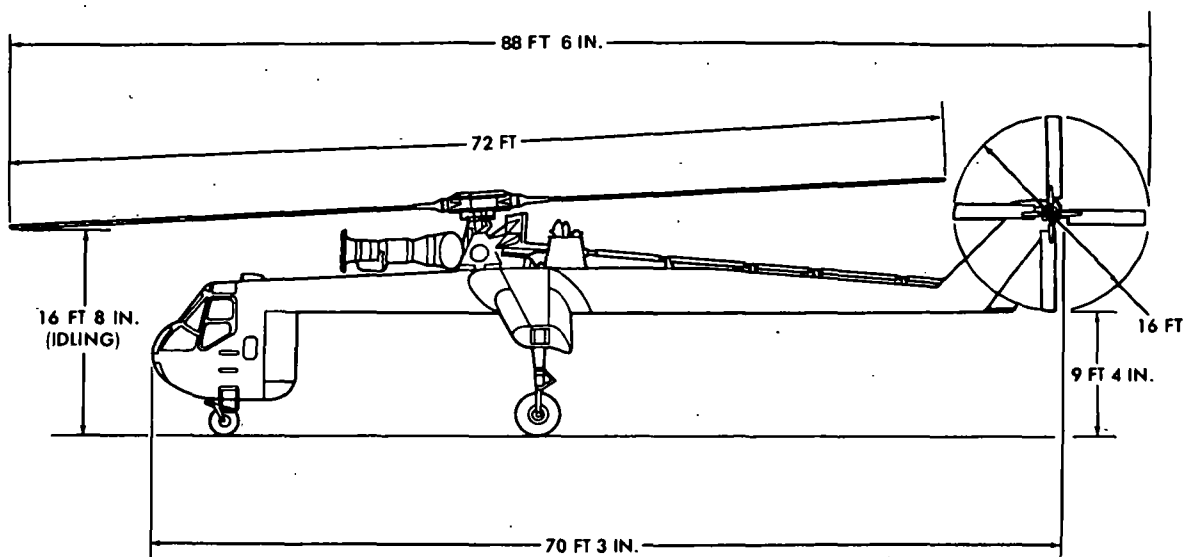
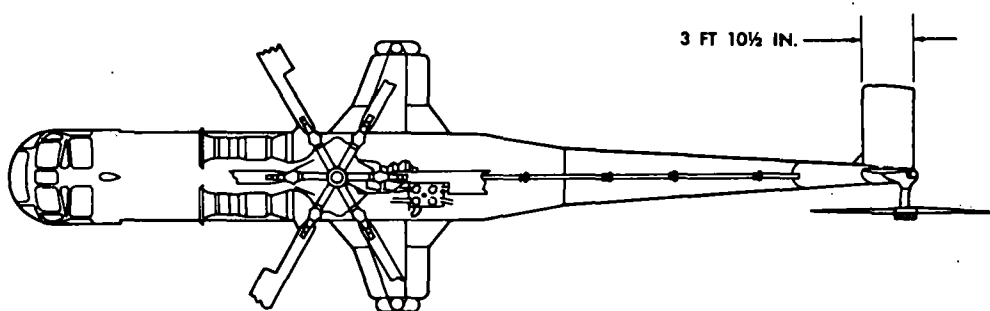
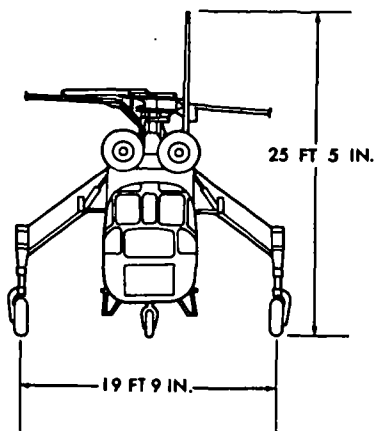


Figure 1-11. Principal Dimensions, CH-54A (Tarhe)

1-28. CH-54A (Tarhe) Characteristics.

ENGINE	MISSION AND DESCRIPTION	WEIGHTS	
No. & model (2) T73-P-1 Mfr Pratt & Whitney Spec 2453 Type Axial Weight 925 lb	Mfr's Model: Sikorsky S-64E Missions that may be accomplished with the CH-54A helicopter include: movement of heavy outsized loads, towing of surface vehicles, recovery of downed aircraft, and by use of detachable pods, transportation of personnel, vehicles, and equipment(including Paratroop Operations). Since cargo is carried externally by a hoist, the ground crew may load or unload cargo while the helicopter hovers overhead, thereby extending the operational capability into areas unsuitable for landing. Flattopped fuselageserves as a work platform for servicing engines, rotor systems, and main components. This helicopter is of the all-metal, single main rotor type with one anti-torque tail rotor. The two gas turbine engines are located above the fuselage. The wheel-type alighting gear consists of two fixed main gear assemblies and a fixed nose gear assembly. The enclosed cockpit forming the nose of the helicopter carries basic accommodations for pilot, copilot, and an aft facing pilot. Conventional helicopter flight controls are provided for forward facing pilot seats. Automatic stabilization equipment is also provided. The aft facing pilot seat has cyclic and directional trim controls and a conventional collective pitch stick. Cargo handling provisions include a hydraulic powered hoist. Space and structural provisions are also made for a cargo sling or towing assembly.	LB Empty 19,219 Basic 21,361 Gross (design) . . . 38,000 (alternate) .. 42,000	L.F. 2.50 2.26
ENGINE RATINGS		FUEL AND OIL	
T73-P-1 SHP RPM MIN Military .. 4500 9000 30 Normal rated ....4000 9000 Cont.		Fuel: Grade JP-4 or -5 Spec MIL-T-5624 Qty 1342 (8723 lb. JP-4) Oil: Spec MIL-L-23699 Qty 1.73 gal	
TECHNICAL PUBLICATION	DEVELOPMENT	AVIONICS/ARMAMENT	
Airframe: TM55-1520-217-10/1 TM55-1520-217-23-1 TM55-1520-217-23P TM55-1520-217-PMS Engine: TM55-2840-230-23 TM55-2840-230-23P DMWR55-2840-230 Auxiliary Power Unit: TM55-2835-203-24 TM55-2835-203-23P DMWR55-2835-100	First production acft delivered Nov 66 Production status out of production	Refer to chapter 2.	
	FEATURES	FLYAWAY COSTS/NSN	
	Six-blade main rotor. Rear facing seat for aft pilot/hoist operator A four-point 20,000 lb capacity load suspension system and a 20,000 lb capacity single point cargo hoist. Four-blade, anti-torque tail rotor.	Crew (normal) 3 Pilot 1 Copilot 1 Aft pilot 1 Observers 2 Passengers (with Pod Attached) Troops 45 or Litters 24 and Attendants 3	CH-54A, NSN 1520-00964-9601 Line K30515, Cost \$2,660,828

1-29. Loading and Performance — Typical Mission, CH-54A (Tarhe)

CONDITIONS	20 MILE RADIUS MISSION I	FULL FUEL RADIUS MISSION II	FERRY MISSION III
TAKEOFF WEIGHT <u>4/</u> (lb) ...	42,000	42,000	30,084
Fuel (lb) ...	2,790	8,723	8,723
Payload (outbound) <u>3/</u> (lb) ...	17,849	11,916	—
Payload (inbound) <u>3/</u> (lb) ...	19,289	5,958	—
Takeoff power loading (lb/bhp) ...	6.36	6.36	4.59
Disc. Loading (lb/sq ft) ...	10.31	10.31	7.44
Max rate of climb at SL <u>1/</u> (fpm) ...	1,350	1,350	2,625
Max rate of climb (one engine out) <u>1/</u> (fpm) ...	450	450	1,525
Service ceiling (100 fpm) <u>2/</u> (ft) ...	8,000	8,000	—
Service ceiling (one engine out) <u>1/</u> (ft) ...	2,000	2,000	12,000
RANGE (nmi) ...	—	—	239
Average cruising speed (kn) ...	—	—	110
Mission time (hrs) ...	—	—	2.4
RADIUS (nmi) ...	20	110	—
Average cruising speed (kn) ...	98	100	—
Mission time (hrs) ...	0.5	2.0	—
LANDING WEIGHT (lb) ...	21,615	22,233	22,233

1/ Maximum power.

2/ Normal power.

3/ Carried by single point hoist or four point load suspension system.

4/ Includes crew of 3 at 200 lb each. Does not include baggage. Engine Air Particle Separators (EAPS) at 360 lbs or Passive Defense (Armor) Protection at 1185 lbs.

Performance Basis:

Data Source: Army CH-54A Model Spec No. SER64509-2.
TM 55-1520-217-10/1 Operator's Manual (CH-54A)

Performance is based on powers shown in paragraph 1-21.

FORMULA: MISSION I (20 mile radius, single point load)

Warm up for 2 minutes, takeoff at sea level, standard day conditions and climb at BROG. Cruise out 20 nautical miles at 2000 ft pressure altitude, standard day conditions, to a sea level standard day remote site. Hover for 5 minutes out of ground effect while delivering and picking up cargo. Climb at BROG and cruise back at 2000 ft pressure altitude, standard day conditions, to a sea level standard day home base. Hover for 1 minute out of ground effect and deposit cargo. Land with 10% initial fuel reserve.

FORMULA: MISSION II (full fuel radius, four point load)

Warm up for 2 minutes, takeoff at sea level, standard day conditions with full fuel load. Cruise out as far as possible to a sea level, standard day remote site. Land, idle for 5 minutes, deliver & pickup cargo. Takeoff, cruise back to sea level standard day home base. Deposit cargo. Land with 10% initial fuel reserve. Return load equals one half outbound load.

FORMULA: MISSION III (Ferry)

Warm up 1 minute, takeoff at sea level standard day conditions and cruise out at best range speed until only reserve fuel remains. Land with 10% initial fuel reserve.

Source: DRSTS-WC

DIMENSIONS

Main rotor dia.	72 Ft. 3 In.
Length:	
Rotors	
operating	88 Ft. 6 In.
Fuselage	70 Ft. 3 In.
Height (static)	25 Ft. 4 In.
Width (cockpit)	7 Ft. 1 In.
Tread	21 Ft. 10 In.
Gnd clearance:	
Main rotor (idling)	15 Ft. 8 In.
Tail rotor	9 Ft. 4 In.

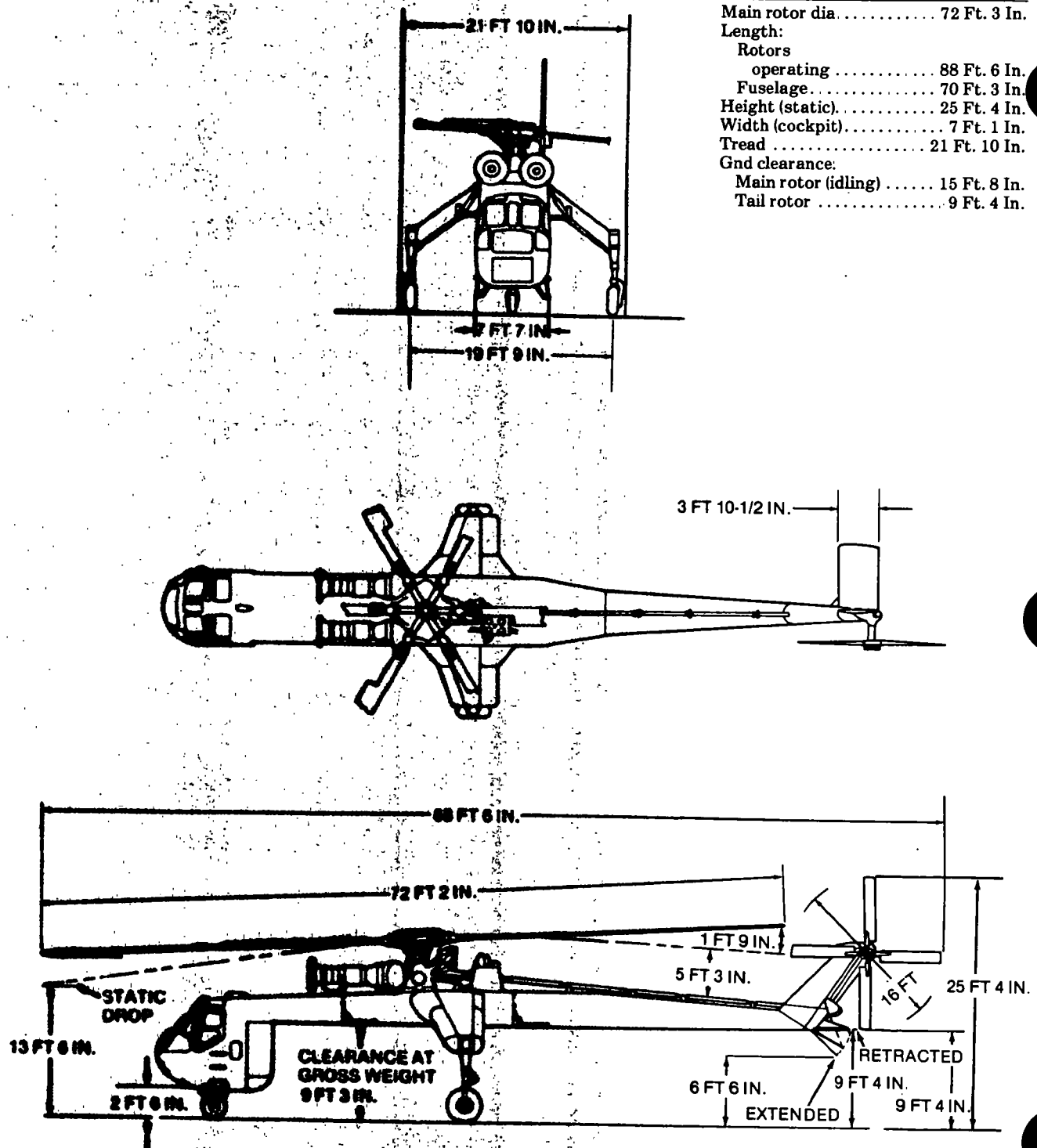


Figure 1-12. Principal Dimensions, CH-54B (Tarhe)

1-30. CH-54B (Tarhe) Characteristics.

ENGINE				MISSION AND DESCRIPTION		WEIGHTS	
No. & model (2)T73-P-700				Mfr's Model: Sikorsky S-64F Missions that may be accomplished with the CH-54B helicopter include: movement of heavy outside loads, towing of surface vehicles, recovery of downed aircraft, and by use of detachable pods, transportation of personnel, vehicles, and equipment (including paratroop operations). Since cargo is carried externally by a hoist, the ground crew may load or unload cargo while the helicopter hovers overhead, thereby extending operational capability into areas unsuitable for landing. The flat top of the fuselage serves as a work platform for maintenance and servicing of the engines, rotor systems and other components of the power train system. The CH-54B is an all-metal single, main rotor type helicopter with one anti-torque tail rotor. It is powered by two gas turbine engines located above the fuselage. The wheel type landing gear consists of two fixed main gear assemblies and single fixed, fully swiveling nose gear assembly. The fuselage and landing gear are constructed and assembled in a crane configuration. The enclosed cockpit forming the nose of the aircraft has basic accommodations for pilot, co-pilot, aft-facing pilot and two observers. Conventional helicopter flight controls are provided for the pilot and co-pilot. The aft-facing pilot has electrically operated cyclic and directional trim controls and a conventional collective pitch control. An automatic flight control system (AFCS) is also provided. Cargo handling capabilities consist of a removable single point hydraulic powered four point load suspension system. Provisions are also made for installation of a towing kit.		LB L.F.	
Mfr Pratt & Whitney						Empty 19,864	
Spec 2456						Basic 22,386	
Type Axial						Gross (Design) . . 47,000 2.0	
Weight 935 lbs							
ENGINE RATINGS						FUEL AND OIL (USABLE)	
	SHP	RPM	MIN			Fuel:	
Military	4800	9000	30			Grade JP-4 or -5	
Normal						Spec MIL-T-5624	
rated	4430	9000	Cont.			Qty 1342 (8723 lb. JP-4)	
TECHNICAL PUBLICATION						Oil:	
Airframe:						Spec MIL-L-23699	
TM55-1520-217-10/2						Qty 1.73 gal	
TM55-1520-217-23/2							
TM55-1520-217-23P							
TM-1520-217-PMS							
Engine:				DEVELOPMENT		AVIONICS/ARMAMENT	
TM55-2840-230-23						Refer to chapter 2.	
TM55-2840-230-23P							
DMWR55-2840-230							
Auxiliary Power Unit:				First flight June 1969		FLYAWAY COSTS/NSN	
TM55-2835-203-24				First production aircraft delivered Dec 1969			
TM 55-2835-203-23P				Production status Out of production			
DMWR55-2835-100							
				FEATURES		PERSONNEL	
				Six-blade main rotor.		Crew (normal) 3	
				Aft-facing pilot/hoist operator.		Pilot 1	
				25,000 lb. capacity four point		Co-pilot 1	
				load suspension system.		Aft-pilot 1	
				25,000 lb. capacity single		Observers 2	
				point hoist.		Passengers (with pod attached)	
				Four-blade anti-torque tail rotor.		Troops 45	
						Litters 24	
						Attendants 3	

1-31. Loading and Performance — Typical Mission, CH-54B (Tarhe)

		20 MILE RADIUS MISSION I	FULL FUEL RADIUS MISSION II	FERRY MISSION III
TAKEOFF WEIGHT <u>5/</u>	(lb) ...	47,000	47,000	31,109
Fuel	(lb) ...	2,906	8,723	8,723
Payload (outbound) <u>3/</u>	(lb) ...	21,708	15,891	—
Payload (inbound) <u>3/</u>	(lb) ...	23,220	7,946	—
Takeoff power loading	(lb/bhp) ...	5.95	5.95	3.79
Disc Loading	(lb/sq ft) ...	11.50	11.50	7.36
Max rate of climb at SL <u>1/</u>	(fpm) ...	1,350	1,350	2,915
Max rate of climb (one engine out) <u>1/</u>	(fpm) ...	490	490	1,890
Service ceiling (100 fpm) <u>2/</u>	(ft) ...	10,000	10,000	—
Service ceiling (one engine out) <u>1/</u>	(ft) ...	2,000	2,000	12,000
RANGE <u>4/</u>	(nmi) ...	—	—	226
Average cruising speed	(kn) ...	—	—	100
Mission time	(hrs) ...	—	—	2.3
RADIUS <u>4/</u>	(nmi) ...	20	101	—
Average cruising speed	(kn) ...	103	100	—
Mission time	(hrs) ...	0.5	2.0	—
LANDING WEIGHT	(lb) ...	22,650	21,514	23,258

1/ Maximum power.2/ Normal power.3/ Carried by single point hoist or four point load suspension system.4/ Detailed descriptions of missions are given in paragraph 1-22.5/ Includes crew of 3 at 200 lb each. Does not include baggage, Engine Air Particle Separators (EAPS) at 360 lbs or Passive Defense (Armor) Protection at 1285 lbs.

Performance Basis:

Data Source: Army CH-54B Model Spec No. SER64279.

TM 55-1520-217-10/2 Operator's Manual (CH-54B)

Performance is based on powers shown in paragraph 1-23.

Source: DRSTS-WC

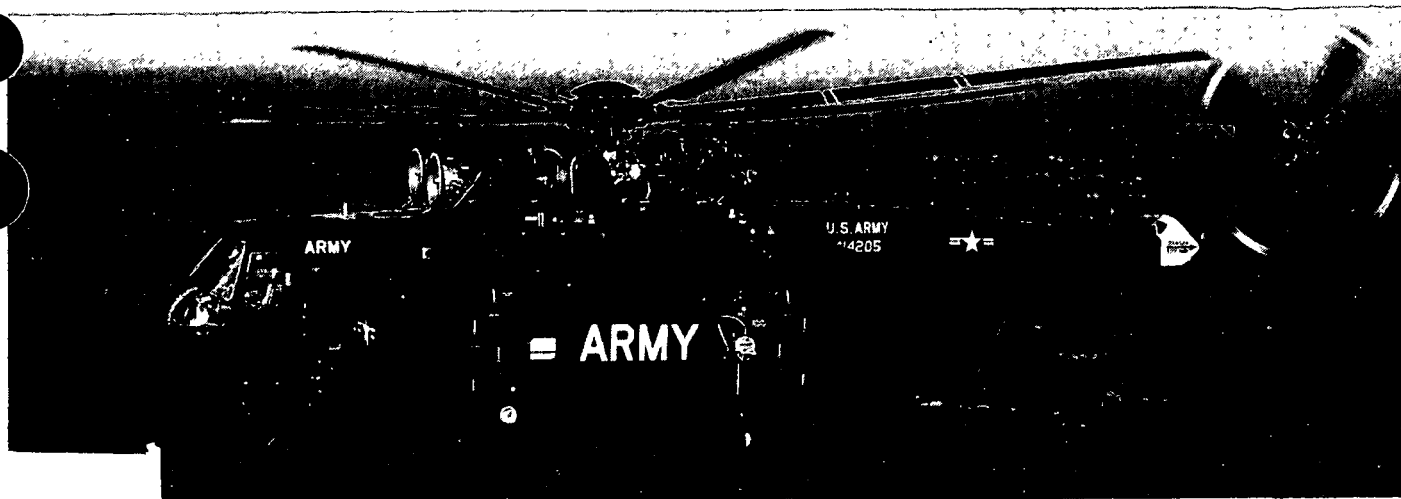
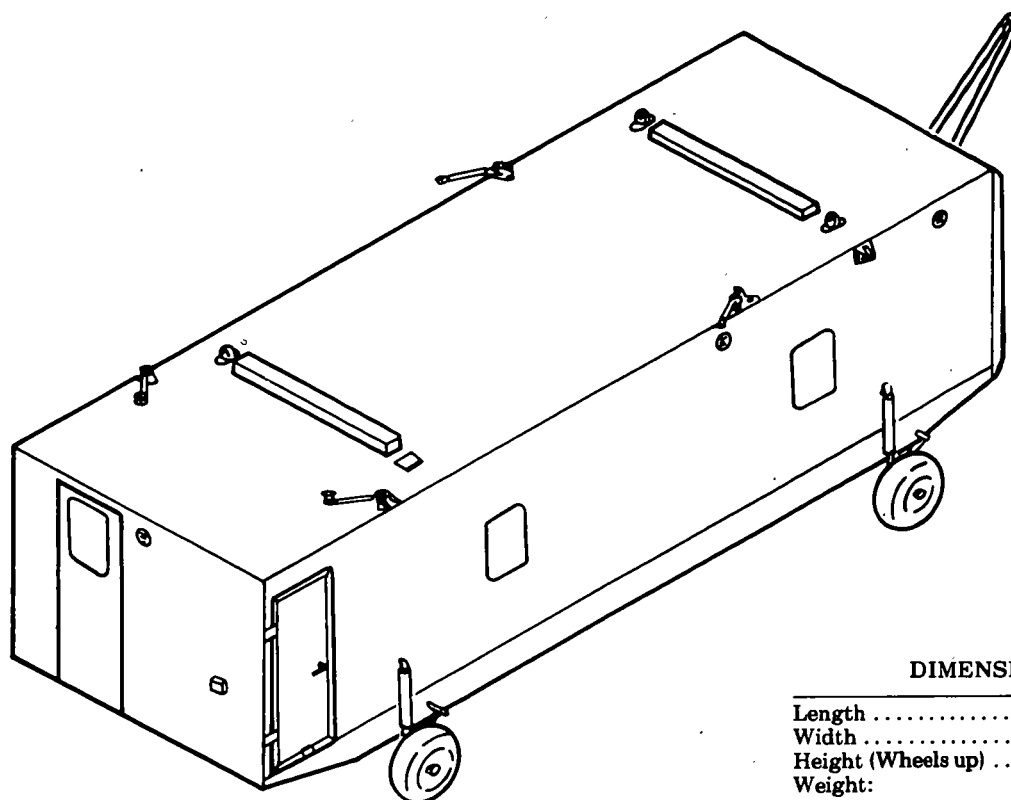


Figure 1-13. CH-54A and B (Tarhe), Typical, with Universal Military Pod



DIMENSIONS

Length	28 Ft. 1 In.
Width	9 Ft. 6 In.
Height (Wheels up)	7 Ft. 8 In.
Weight:	
Empty	3020 pounds
Max Load	20,000 pounds

Figure 1-14. Universal Military Pod

1-32. Universal Military Pod CH-54A and B (Tarhe).

The universal military pod is a semimonocoque structure with a rear loading split door-ramp extending the full width and height of the pod. The split-door construction permits both sides to be opened independently, and reduces the probability of jamming. This arrangement permits easier exit in case of an emergency. Two forward doors, one on each side of the pod, are jettisonable and can be opened from both inside and outside. Each door has a secure locking device to prevent inadvertent opening in flight. Four windows, two on each side, are installed using a rubber push-out type seal and can be removed from both the inside and outside of the pod. A nonstructural panel with a push-out type window is in the forward bulk-head. The window is removable from inside the pod. Additional design features follow:

a. Floor loading is 334 pounds per square foot at any location. In the vehicular tread area the maximum allowable floor loading is 1500 lbs/sq. ft. The floor is reinforced to accommodate equipment as heavy as a 155 Howitzer. Cargo fittings are flush with the floor and have a load capacity of 5000 pounds each. The spacing of the fittings is a standard 20-inch grid pattern.

b. Pod is attached to helicopter load leveler system. Two rubber strips are attached to the top of the pod, running full width, to prevent chafing between the top of the pod and the bottom of the helicopter. When the pod carries troops (passengers) or litter patients, safety provisions require the insertion of screw actuated pins in the primary adapter fittings. This will prevent jettisoning of the load. The primary missions for the pod are to carry a maximum of 45 troops (passengers) or 24 litter patients and to transport general cargo such as missiles, vehicles, weapons, and general supplies.

c. Pod has a conventional four wheel system with pneumatic tires and may be towed at speeds up to 5 miles per hour on level ground at the maximum gross weight of 20,000 pounds. Each of the four wheels has an independent retraction and extension system manually-operated by the mechanical jacks or alternate hydraulic pumps attached to each wheel gear. These permit the pod to be raised or lowered when fully loaded. This action aids unloading the pod by allowing the use of a fork lift and other cargo moving equipment. To obtain the maximum pod wheel ground clear-

ance of 18 inches, when the pod is attached to the helicopter, full retraction of the pod wheels is possible. Detachment from the helicopter without using winches is made by extending the wheel mechanism.

d. Electrical power is supplied to pod by the helicopter's electrical system. When the pod is attached to the helicopter, two cables on the front exterior bulk-head of the pod are attached to the ac and dc receptacles on the left side external skin of the helicopter, marked POD PWR AC, DC, ICS. When the pod is not attached to the helicopter, electrical power is supplied from a ground source through cables to the ac and dc receptacles marked EXT POWER 115 VOLTS AC and EXT POWER 28 VOLTS DC 4-9, on the left side of the pod.

e. Lighting for the interior of the pod consists of twelve light assemblies, arranged in parallel lines of six lights each on the ceiling. The forward two lights near the entrance doors are white or red controlled by a switch marked ENTRANCE LIGHTS WHITE AND RED. The eight interior lights are controlled by a switch marked INTERIOR LIGHTS, ON-OFF. Both switches are on the master switch panel on the left forward wall of the pod. The last two lights at the ramp end of the pod are controlled by a switch at the rear on the left wall (figure 4-11) marked CARGO LOADING LIGHTS, ON-OFF. Communication between the pod and the helicopter is through a third cable, in the same area as the electrical power cables. The cable is attached to the ICS outlet on the helicopter and is routed to the interphone control panel for the pod, which is on the forward ceiling. Also in this area is a stowage rack for the 30-foot cable.

f. Electrically-operated ventilating blower with a capacity of 500 cfm is installed on the forward bulk head of the pod and is controlled by a switch marked VENT BLOWER, ON-OFF on the master switch panel. Two exhaust openings are on the right and left sides of the pod in the rear area.

Source: DRSTS-WC



Figure 1-15. OH-6A (Cayuse)

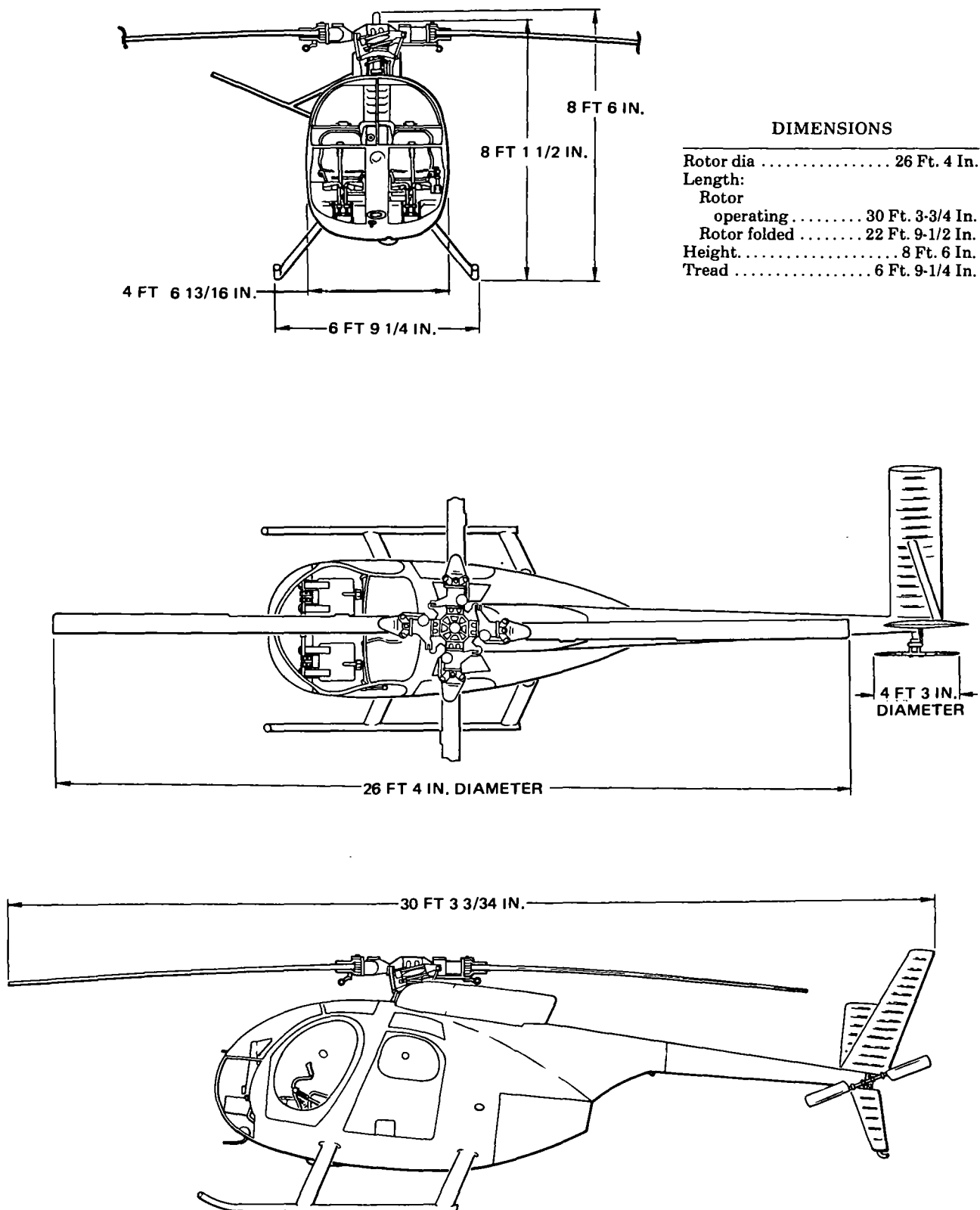


Figure 1-16. Principal Dimensions, OH-6A (Cayuse)

1-33. OH-6A (Cayuse) Characteristics.

ENGINE			MISSION AND DESCRIPTION		WEIGHTS	
No. & model .. (1) T63-A-5A/700 Mfr Detroit Diesel - Allison Div of GMC Engine spec No. T63-A-5A 580J, dtd 30 Sept 1970 T63-A-700 803F, dtd 30 Sept 1970 Amend 1.			Mfr's Model: Hughes 500 The principal missions of the OH-6A light observation helicopter are visual observation and target acquisition, reconnaissance, and command control. This helicopter is employed in support of combat companies, and will operate for extended periods of time with only such support as provided by one mechanic with handtools. Normal operation is limited to day or night visual flight conditions. The light observation helicopter is a single-lifting, 4-blade rotor, 4-place helicopter with a normal gross weight of 2400 lb or less. It is powered by a T63-A-5A/700 free turbine engine with 317 SHP, derated to 252.5 SHP. It incorporates dual flight controls with the secondary cyclic control element easily removable. The flight instruments are limited to those required for day and night marginal visual conditions. The cargo area contains troop-type seats which are easily stowable when not in use.		Empty 1158 Useful load 1242 Pilot 200 Observers (2), Copilot (1) 600 Cargo 42 Fuel 400 Gross (FAA certified) 2400 Max structure 2700	
ENGINE RATINGS			DEVELOPMENT		FUEL AND OIL	
Ratings Output SHP Takeoff & mil *317 Normal **270 Output speed SFC lb/SHP- HR rpm Takeoff & mil 6000 0.697 Normal 6000 0.706 Above ratings developed on standard sea level static conditions. *Derated to 252.5 for 5 min **Derated to 214.5			Design competition initiated October 1960 Flight evaluation completed June 1964 Production contract May 1965 First production acft deliveries September 1966		Fuel: Grade JP-4 Spec MIL-T-5624 Alternate ... JP-5, MIL-T-5624 Qty 61.3 gal (non-crash resistant) 54.4 gal (crash resistant) Oil: Spec MIL-L-23699 Alternate ... MIL-L-7808 No. tanks .. 1 Location ... Engine section Qty 3 qt Main Transmission: Spec MIL-L-23699 Alternate ... MIL-L-7808 Qty 8.0 pt Tail Rotor Transmission: Spec MIL-L-23699 Alternate ... MIL-L-7808 Qty 0.5 pt	
TECHNICAL PUBLICATIONS			PERSONNEL		AVIONICS/ARMAMENT	
Airframe: TM55-1520-214-10 TM55-1520-214-23 TM55-1520-214-23P TM55-1520-214-PMS DMWR55-1520-214 Engine: TM55-2840-231-24 TM55-2840-231-23P			Dual controls. Stowable troop seats.		Crew (normal) 1 Observer 2 Copilot 1	
					Refer to chapter 2.	
					FLYAWAY COSTS/NSN	
					NSN 1520-00918-1523 Lin K30645 Costs \$125,821	

1-34. Loading and Performance — Typical Mission, OH-6A (Cayuse).

	BASIC MISSION I	ALTERNATE IA (CLEAN) II	ALTERNATE IA (ARMED) III	FERRY RANGE IV	HIGH SPEED SEA LEVEL MISSION V
TAKEOFF WEIGHT	(lb) ...	2159	2400	2400 ^{6/}	2159
Fuel	(lb) ...	400	400	400	400
Payload (not including pilot)	(lb) ...	400	637 ^{4/}	400	400
Takeoff power loading	(lb/bhp) ...	8.55	9.50	9.50	8.55
Disk loading	(lb/sq ft) ...	3.96	4.41	4.41	3.96
Speed for Min. R/D	(knots) ...	54.0	54.0	54.0	54.0
Max rate of climb at sea level ^{1/}	(fpm) ...	1925	1560	1560	1925
Speed for max R/C, sea level ^{1/}	(knots) ...	56.0	58.0	58.0	56.0
Time: Sea level to 5000 ft ^{1/}	(minutes) ..	2.5	3.3	3.3	2.5
Time: Sea level to 10,000 ft ^{1/}	(minutes) ..	5.3	7.0	7.0	5.3
Service ceiling (100 fpm) ^{2/}	(ft) ...	18,400	15,850	15,850	18,400
Absolute hover ceiling ^{1/}	(ft) ...	11,200	6,500	6,500	11,200
COMBAT RANGE	(nmi) ...	370	330	316	294
Average cruising speed ^{7/ 8/}	(knots) ...	104	102	100	130
Cruising altitude	(ft) ...	12,200	9600	9500	SL
Total mission time	(hr) ...	3.6	3.3	3.2	2.3
COMBAT RADIUS	(nmi) ...	185	165	158	147
Average cruising speed ^{7/ 8/}	(knots) ...	104	102	100	130
Cruising altitude	(ft) ...	12,200	9600	9500	SL
Mission time	(hr) ...	3.6	3.3	3.2	2.3
COMBAT WEIGHT ^{3/}	(lb) ...	1961	2207	2208	1977
COMBAT ALTITUDE	(ft) ...	12,200	9600	9500	SL
Combat speed ^{7/}	(knots) ...	116	112	112	130
Combat climb ^{1/}	(fpm) ...	1860	1680	1680	2220
Service ceiling ^{2/}	(ft) ...	20,950	17,850	17,850	20,750
Absolute hover ceiling ^{1/}	(ft) ...	14,400	10,500	10,500	14,100
Max rate of climb @ sea level ^{1/}	(fpm) ...	2250	1860	1860	2220
Speed for max R/C, sea level	(knots) ...	55	56	56	55
Maximum speed ^{7/ 8/}	(knots) ...	104	102	100	130
Basic speed at 5000 ft ^{7/}	(knots) ...	117	113	110	
LIMIT FLIGHT LOAD FACTORS					
Maneuver Positive	(g) ...	2.82	2.54	2.54	2.82
Maneuver Negative	(g) ...	0.50	0.50	0.50	0.50

^{1/}Takeoff power up to 5 minutes.^{2/}Normal power.^{3/}For RADIUS mission.^{4/}Includes copilot at 200 lbs.

1-34. Loading and Performance — Typical Mission, OH-6A (Cayuse) (CONT).

5/ See Para 1-27.

6/ Includes M-27 or M-27E-1 Armament Kit.

7/ Limited by V_{ne} .

8/ At combat altitude and combat weight.

Performance Basis:

- a. Army flight test YOH-6A.
- b. All performance is out of ground effect and for standard atmospheric conditions. Speeds given are true airspeed.

1-35. Performance Notes, OH-6A (Cayuse).

FORMULA: RADIUS MISSION I, II, & III

Warm up, take off, climb on course at military power to altitude for best range at average cruise weight. Cruise to remote base at speed for best range. Do not land. Return to home base. Range-free allowances are 2 minutes of normal power for warmup and 10 percent of initial fuel for reserves.

FORMULA: RANGE MISSION I, II, & III

Warm up, take off, and climb on course at military power to altitude for best range at average cruise weight. Cruise to remote base at speed for best range. Range-free allowances are 2 minutes of normal power for warmup and 10 percent of initial fuel for reserve.

FORMULA: FERRY RANGE MISSION IV

Warm up, take off, and climb on course at military power to 5,000 feet. At steady cruise, climb to stay at optimum altitude as weight decreases. Range-free allowance is 2 minutes of normal power for warmup. No reserve fuel allowance.

FORMULA: RADIUS MISSION V

Warm up, take off, and accelerate to maximum speed. Cruise at sea level at maximum speed, as limited by normal power or V_{ne} to remote base. Do not land. Return to home base. Range-free allowances are 2 minutes of normal power for warmup and 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION V

Warm up, take off, and accelerate, to maximum speed. Cruise at sea level at maximum speed, as limited by normal rated power V_{ne} to remote base. Range-free allowances are 2 minutes of normal power for warmup and 10 percent of initial fuel for reserve.

GENERAL DATA

For detailed planning refer to applicable technical manual.

PERFORMANCE REFERENCE

Hughes Tool Company-Standard Aircraft Characteristics (OH-6A).

Source: DRSTS-WO



Figure 1-17. OH-58A and C, Light observation helicopter (Kiowa), typical

DIMENSIONS

Rotor dia	35 Ft. 4 In.
Length:	
Rotors	
operating	40 Ft. 11.8 In.
Blades	
removed	32 Ft. 2.0 In.
Height:	
To top of	
rotor fairing	9 Ft. 7.0 In.
Tread of skids	6 Ft. 5.4 In.
Main rotor:	
Disk area	979.8 Sq. Ft.
Blade area	38.26 Sq. Ft.
Tail rotor:	
Disk area	20.97 Sq. Ft.
Blade area	2.26 Sq. Ft.

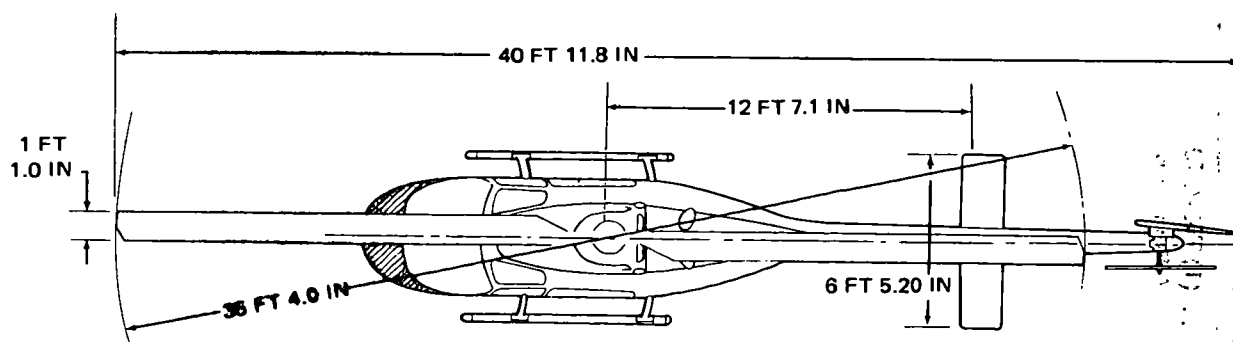
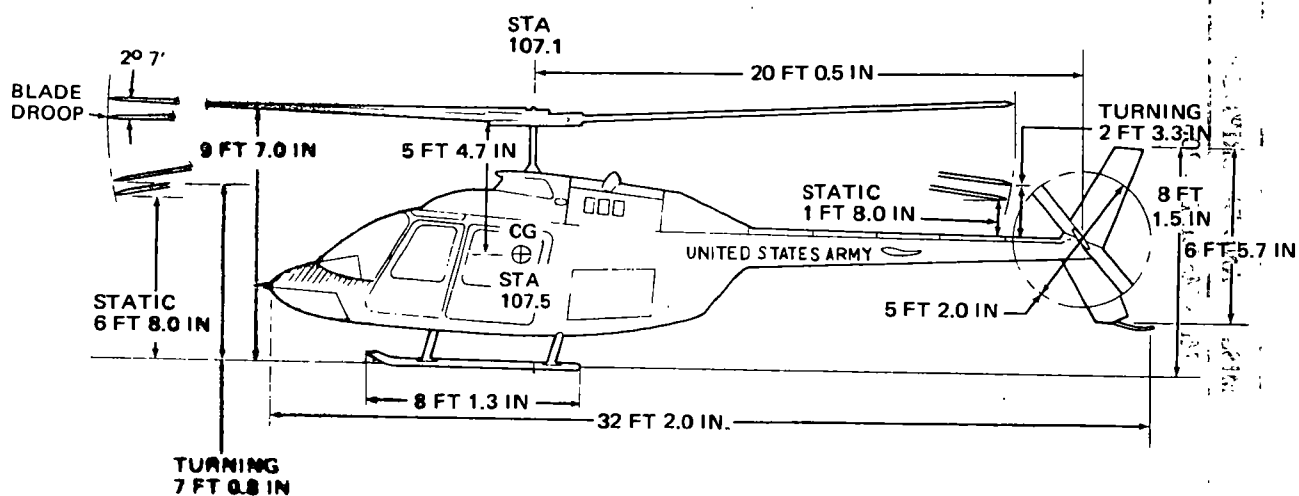
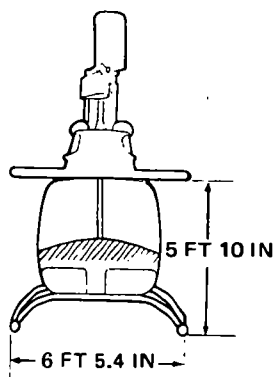


Figure 1-18. Principal Dimensions, OH-58A (Kiowa)

1-36. OH-58A (Kiowa) Characteristics.

ENGINE		MISSION AND DESCRIPTION		WEIGHTS	
No. & model .. (1) T63-A-700 Mfr Allison Corp. Engine spec. no. 803-F Amend- ment 1 Type Axial-centrifugal compressor, free turbine Length 41 in. Width 15.5 in. Height 18 in. Weight 135 lbs. Helicopter rotor gear ratio 17.44:1		Mfg's Model: Bell 206A The missions for which the OH-58A Helicopter are employed are: visual observation, target acquisition, reconnaissance, and command control. The helicopter is readily adaptable to utility tasks at the combat company level without use of special kits or special attach- ments. The helicopter is organic to division, brigade, battalion, or equivalent level, and capable of continuous daily operation in the forward area, with maximum availability to the tactical commander. Normal operation is limited to day and night visual and marginal visual flight conditions. The OH-58A can perform an unarmed observation mission with a 260-mile range or 3.0-hour endurance at a takeoff gross weight of 2760 pounds. It can perform a scout mission, armed with the M-27E-1 weapon system and 2000 rounds of ammunition, with a range at 230 miles at a takeoff gross weight of 2967 pounds. This helicopter is the single engine, single main rotor type. The fuselage is divided into three main sections; the forward section which provides the cabin and fuel cell enclosures as well as the pylon support, the intermediate section which supports the engine provides the equip- ment and electronics compartments, and the tail boom which supports the horizontal stabilizer, the vertical stabilizer, and the tail rotor. The free turbine engine is mounted aft of the main rotor horizontally on top of the fuselage. The landing gear is the shock-absorbing skid type.		LOADING LB L.F. Empty 1671.1 Empty (with armor) 1813. Basic 1766.2 3.50 Design 3000 2.50 Combat Unarmed mission 2842.7 2.64 Armed mission . 3000 2.50 Max structural . . 3000 2.50	
ENGINE RATINGS				FUEL AND OIL	
Standard Sea Level Static Conditions SHP RPM DUR Takeoff 317 6000 5 min. Normal 270 6000 Cont.* *Derated for Transmission				Fuel: Grade JP-4 Spec MIL-T-5624 Alternate ... JP-5, MIL-T-5624 Emergency .. MIL-G-5572 w/o TCP No. Tanks ... 1 Location Fuselage Qty ... 73.0 gal (non-crash resistant) 71.5 gal (crash resistant) Oil: Engine Spec MIL-L-23699 Alternate ... MIL-L-7808 No. Tanks ... 1 Location ... Fuselage Transmission: Spec MIL-L-23699 Alternate ... MIL-L-7808 M/R Hub ... Grade 30 Spec MIL-L-2104	
TECHNICAL PUBLICATION					
AIRFRAME: TM55-1520-228-10 TM-55-1520-228-23 TM55-1520-228-23P TM55-1520-228-PMS DMWR 55-1520-228 ENGINE: TM55-2840-231-24 TM55-2840-231-23P DMWR 55-1520-231 DMWR 55-1520-109		DEVELOPMENT First production aircraft delivered May 1969 Last production aircraft November 1973			
		FEATURES	PERSONNEL	AVIONICS / ARMAMENT	
		Dual controls Rear seat palletized Cargo platform Two bladed seesaw rotor system	Crew (normal) .....1 Observer .....2 Copilot .....1	Refer to chapter 2. FLYAWAY NSN1520-00169-7137, LINE, K31042, COST, \$144,722.	

1-37. Loading and Performance — Typical Mission, OH-58A (Kiowa).

CONDITIONS	I BASIC MISSION (Unarmed Observation)	II ALTERNATE (Armed Scout)
TAKEOFF WEIGHT	2760	2967 ^{4/}
Fuel	455	428 ^{4/}
Payload	170	298 ^{4/}
Takeoff Power Loading	9.15	9.84 ^{4/}
Disk Loading	2.82	3.03 ^{4/}
Speed for Min. R/D	49	49 ^{4/}
Vertical Rate of Climb @ Sea Level ^{1/}		
Max Rate of climb @ Sea Level ^{1/}	1780	1600
Speed for Max R/C @ Sea Level	48	50
Time Sea Level to 5000 ft. ^{1/}	3.5	4.0
Time Sea Level to 10,000 ft. ^{1/}	7.5	8.5
Service Ceiling (100 fpm) ^{2/}	19,000	17,200
Absolute Hover Ceiling ^{1/}	8,000	5,400
COMBAT RANGE	260	230
Average speed	102	120
Cruising Altitude	14,000	10,000
Total Mission Time	2.98	2.47
COMBAT RADIUS	147	121
Average Speed	102	102
Cruising Altitude	14,000	12,200
Total Mission Time	2.98	2.47
COMBAT WEIGHT ^{3/}	2550	2770
Combat Altitude	14,000	10,000
Combat Speed	87	99
Combat Climb ^{1/}	1090	1120
Service Ceiling ^{3/}	21,000	19,500
Absolute Hover Ceiling	10,600	8000
Max R/C @ Sea Level ^{1/}	1750	1600
Speed for Max R/C	48	50
Max Speed @ Sea Level	120	120
Basic Speed @ 5000 ft.	114	114

^{1/} Takeoff power up to 5 minutes.^{2/} Normal Power.^{3/} For Radius Mission.^{4/} Includes M-27E-1 Armament Kit.

Performance Basis: Bell flight test 206A MOD.

All performance is out of ground effect and for standard atmospheric conditions.

1-38. Performance Notes, OH-58A (Kiowa).

RADIUS MISSION — I & II

RANGE MISSION — I & II

Warmup — Two minutes at normal power at sea level
 Takeoff and Climb — On course at military power to altitude for best range at average cruise weight
 Cruise — At speed for best range
 Reserve — 10% takeoff fuel

Source: DRSTS-WO

DIMENSIONS

Rotor dia	35 Ft. 4 In.
Length:	
Rotors	
operating	40 Ft. 11.8 In.
Blades	
removed	32 Ft. 2.0 In.
Height:	
To top of	
rotor fairing	9 Ft. 7 In.
Tread of skids	8 Ft. 5.4 In.
Main rotor:	
Disk area	979.8 Sq. Ft.
Blade area	38.26 Sq. Ft.
Tail rotor:	
Disk area	20.97 Sq. Ft.
Blade area	2.26 Sq. Ft.

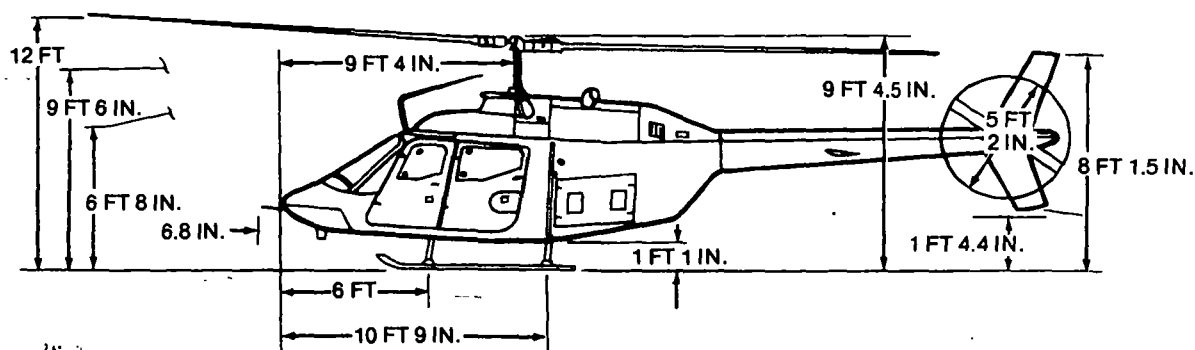
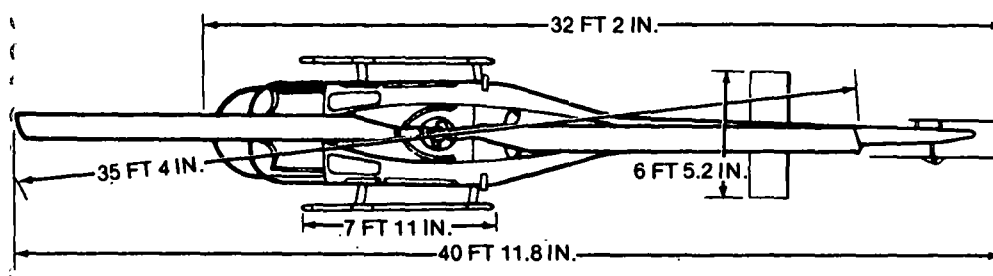
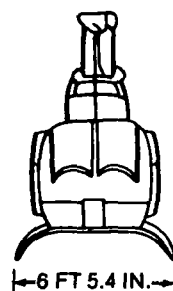
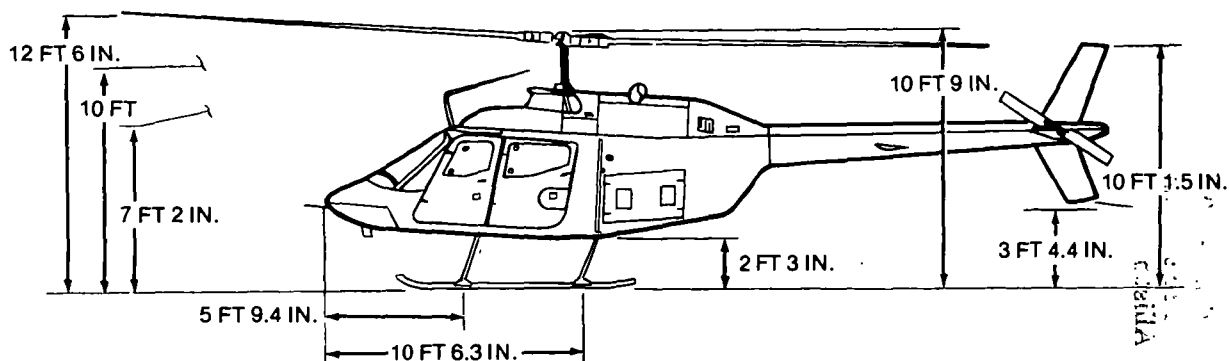
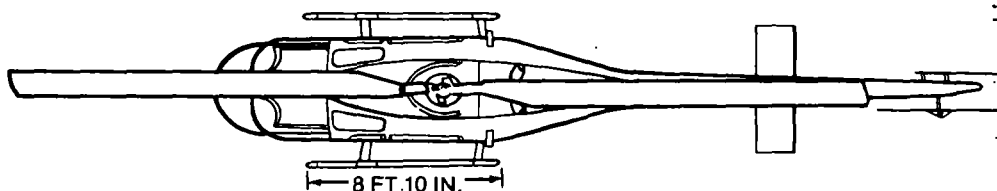
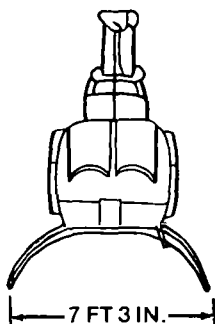


Figure 1-19 Principal Dimensions, OH-58C (Kiowa) Standard Skid Gear

DIMENSIONS

Rotor dia	35 Ft. 4 In.
Length:	
Rotors	
operating	40 Ft. 11.8 In.
Blades	
removed	32 Ft. 2.0 In.
Height:	
To top of	
rotor fairing	9 Ft. 7.0 In.
Tread of skids	8 Ft. 5.4 In.
Main rotor:	
Disk area	979.8 Sq. Ft.
Blade area	38.26 Sq. Ft.
Tail rotor:	
Disk area	20.97 Sq. Ft.
Blade area	2.26 Sq. Ft.



1-39. OH-58C (Hova) Characteristics.

POWER PLANT		MISSION AND DESCRIPTION		WEIGHTS	
No. & model T63-A-720 Mfr Detroit Diesel Allison Engine spec. no. 876 Type Axial-centrifugal compressor, free turbine Length 41.1 Width 19.0 Height 23.2 Weight 158 Helicopter rotor gear ratio 17.44:1		Mfg's Model: Bell 206.5 The missions for which the OH-58C Helicopter are employed are: Reconnaissance, security, aerial observation and target acquisition functions during daylight hours (stabilized optics), and will provide a limited night time capability (night vision goggles) for the conduct of these tasks. In performing these roles, the Interim Scout Helicopter will operate in cavalry, attack helicopter, and field artillery units." The OH-58C can perform an unarmed observation mission with a 185-nm or 2.5-hour endurance at a takeoff gross weight of 3200 pounds. This helicopter is the single engine, single main rotor type. The fuselage is divided into three main sections; the forward section which provides the cabin and fuel cell enclosures as well as the pylon support, the intermediate section which supports the engine provides the equipment and electronics compartments, and the tail boom which supports the horizontal stabilizer, the vertical stabilizer, and the tail rotor. The free turbine engine is mounted aft of the main rotor horizontally on top of the fuselage. The landing gear is the shock-absorbing skid type.		LOADING LB L.F. Empty 1868.5 Empty (with armor) ... 1976.5 Basic 2337.6 Design 3200 Combat Unarmed mission 2915.6 Max structural .. 3200	
ENGINE RATINGS				FUEL AND OIL	
Standard Sea Level Static Conditions SHP RPM DUR Takeoff 317 6000 5 min. Normal 270 600 Cont.* *Derated for Transmission				Fuel: Grade JP-4 Spec MIL-T-4624 Alternate . JP-5, MIL-T-5624 Emergency MIL-G-5572 w/o TCP No. Tanks . 1 Location ... Fuselage Qty 73.0 gal (non-crash resistant) 71.5 gal (crash resistant) Oil: Engine Spec MIL-L-23699 Alternate . MIL-L-7808 No. Tanks . 1 Location .. Fuselage Transmission: Spec MIL-L-23699 Alternate . MIL-L-7808 M/R Hub ... Grade 30 Spec MIL-L-2104	
TECHNICAL PUBLICATION					
AIRFRAME: TM55-1520-235-10 TM55-1520-228-23 TM55-1520-228-23P DMWR 55-1520-228 ENGINE: TM55-2840-241-23 TM55-2840-241-23P DMWR 55-2840-242		DEVELOPMENT			
		First production aircraft delivered Anticipated Sept. 78 Last production aircraft			
		FEATURES	PERSONNEL	AVIONICS / ARMAMENT	
		Dual controls Rear seat palletized Cargo platform Two bladed seesaw rotor system	Crew (normal) 1 Copilot 1	Refer to chapter 2.	
				FLYAWAY	
				NSN, 1502-01020-4216, LIN *233527, COST \$201,898	

1-40. Loading and Performance — Typical Mission, OH-58C (Kiowa).

CONDITIONS	I BASIC MISSION (Unarmed Observation)	II ALTERNATE (Armed Scout)
TAKEOFF WEIGHT	2915.6	N/A
Fuel	456	
Payload	284	
Takeoff Power Loading		
Disk Loading	2.98	
Speed for Min. R/D	50	
Vertical Rate of Climb @ Sea Level	6300	
Max Rate of Climb $\frac{1}{2}$		
Service Ceiling	16,400	
Absolute Hover Ceiling	12,300	
COMBAT RANGE $\frac{1}{2}$	185 NM	
Average Speed	100 K	
Cruising Altitude		
Total Mission Time		
COMBAT RADIUS		
Average Speed		
Cruising Altitude		
Total Mission Time		
COMBAT WEIGHT		
Combat Altitude		
Combat Speed		
Combat Climb		
Service Ceiling		
Absolute Hover Ceiling		
Max R/C @ Sea Level		
Speed for Max R/C		
Max Speed @ Sea Level	120 K	
Basic Speed @ 5000 ft.		

 $\frac{1}{2}$ 2000 ft. @ 95°F

NOTE: Final performance data not available pending completion of testing.

1-41. Performance Notes, OH-58C (Kiowa).

RADIUS MISSION — I & II

RANGE MISSION — I & II

Warmup — Two minutes at normal power at sea level

Takeoff and Climb — On course at military power to altitude for best range at average cruise weight

Cruise — At speed for best range

Reserve — 10% takeoff fuel

Source: DRSTS-WO



Figure 1-21. TH-55A (Osage)

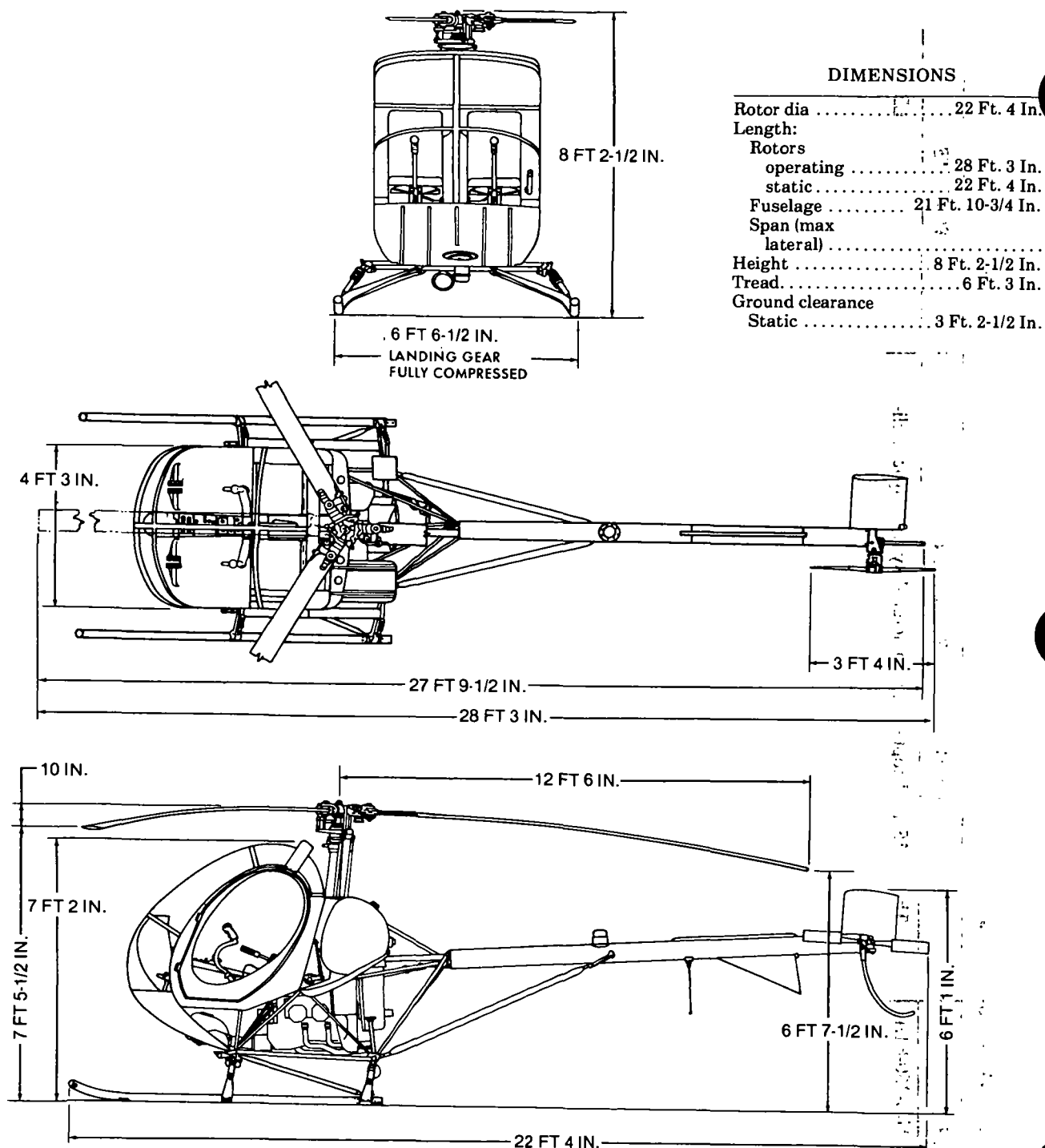


Figure 1-22. Principal Dimensions, TH-55A (Osage)

1-42 TH-55A (Osage) Characteristics.

ENGINE				MISSION AND DESCRIPTION		WEIGHTS	
No. & model .. (1) H10-360-B1A Mfr Lycoming Engine spec. No. 2313-b Engine to main rotor rear ratio 6:1				The TH-55A helicopter is manufactured by the Hughes Helicopter Company, Culver City, California. The mission of the TH-55A is the training of military pilots in the basic operation and performance of a helicopter. Training will be accomplished only in CONUS and from an established aviation training base. The two-place cabin is designed to accommodate an instructor and student with the seating arrangement side by side. The instructor and student each have a complete set of flight controls.		LB Empty 1008.1 Useful load 591.9 Design (gross) 1600 Combat NA Max takeoff 1600	
ENGINE RATINGS						FUEL AND OIL	
BHP RPM MIN Takeoff 180 2900 5 Normal 160 2700-2900 Cont. max power						Fuel: Grade 115/145 Spec MIL-G-5572 No. of tanks 1 Location Left rear of cabin Qty 25 gal Oil: Spec Temps above +60°F MIL-L-22851 Type II Temps below +60°F MIL-L-22851 Type III No. tanks 1 Qty 2 gal	
TECHNICAL PUBLICATIONS				DEVELOPMENT		AVIONICS / ARMAMENT	
AIRFRAME: TM55-1520-233-10 COMMERCIAL MANUALS (Contractor Supported)				Contract awarded June 1964 First acft delivered November 1964 Last production acft April 1969		Refer to chapter 2.	
ENGINE: COMMERCIAL MANUAL				FEATURES		FLYAWAY COSTS / NSN	
				PERSONNEL		NSN-1520-00758-0289, Line K31153, COST \$35,590	
Dual Controls				Crew (Normal) 2 Instructor Pilot 1 Student Pilot 1			

1-43. Loading and Performance — Typical Mission, TH-55A (Osage).

CONDITIONS	BASIC MISSION
Fuel at 6.0 lb/gal (grade 115/145) (lb) ...	150
Payload (lb) ...	591.9
Cruise speed at SL (kn) ...	75
Rate of climb at SL (ft/min) ...	1400
Endurance (2700 rpm)	2-1/2 hrs at 65 knots cruise speed (min)
Hover ceiling, out of ground effect, 110°F (ft) ...	1000 (min)
Normal autorotation speed (kn) ...	45
Normal autorotation rotor speed (rpm) ...	480
Autorotation rate of descent at 1000 ft, 100°F, 480 rpm and 45 knots (ft/min) ...	1900 (max)
Altitude necessary to regain normal autorotation rotor speed from lower red line (ft) ...	200 (max)
Range (normal) (nmi) ...	200
Service ceiling (ft) ...	11,000

Source: DRSTS-WO

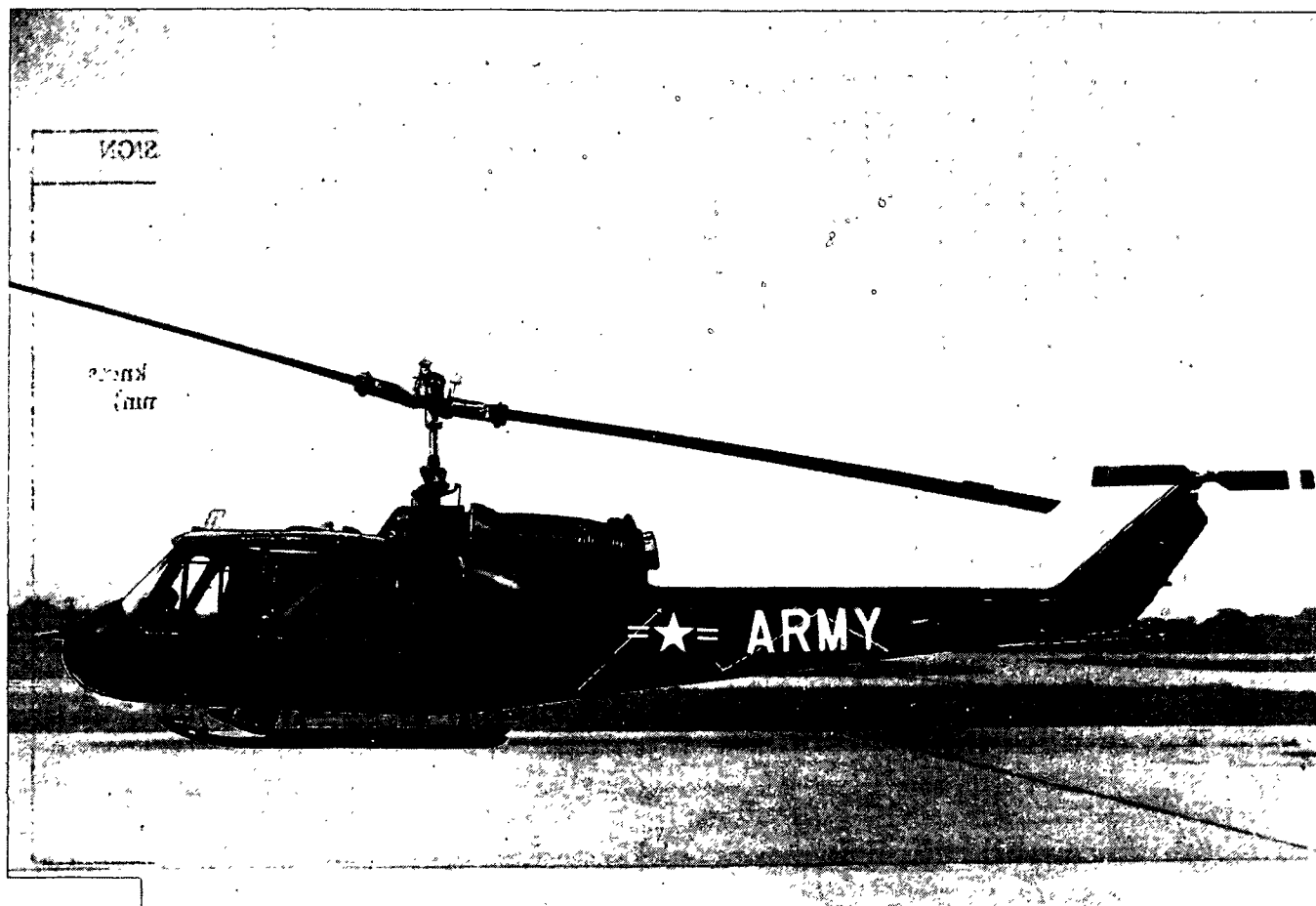


Figure 1-23. UH-1B (Iroquois)

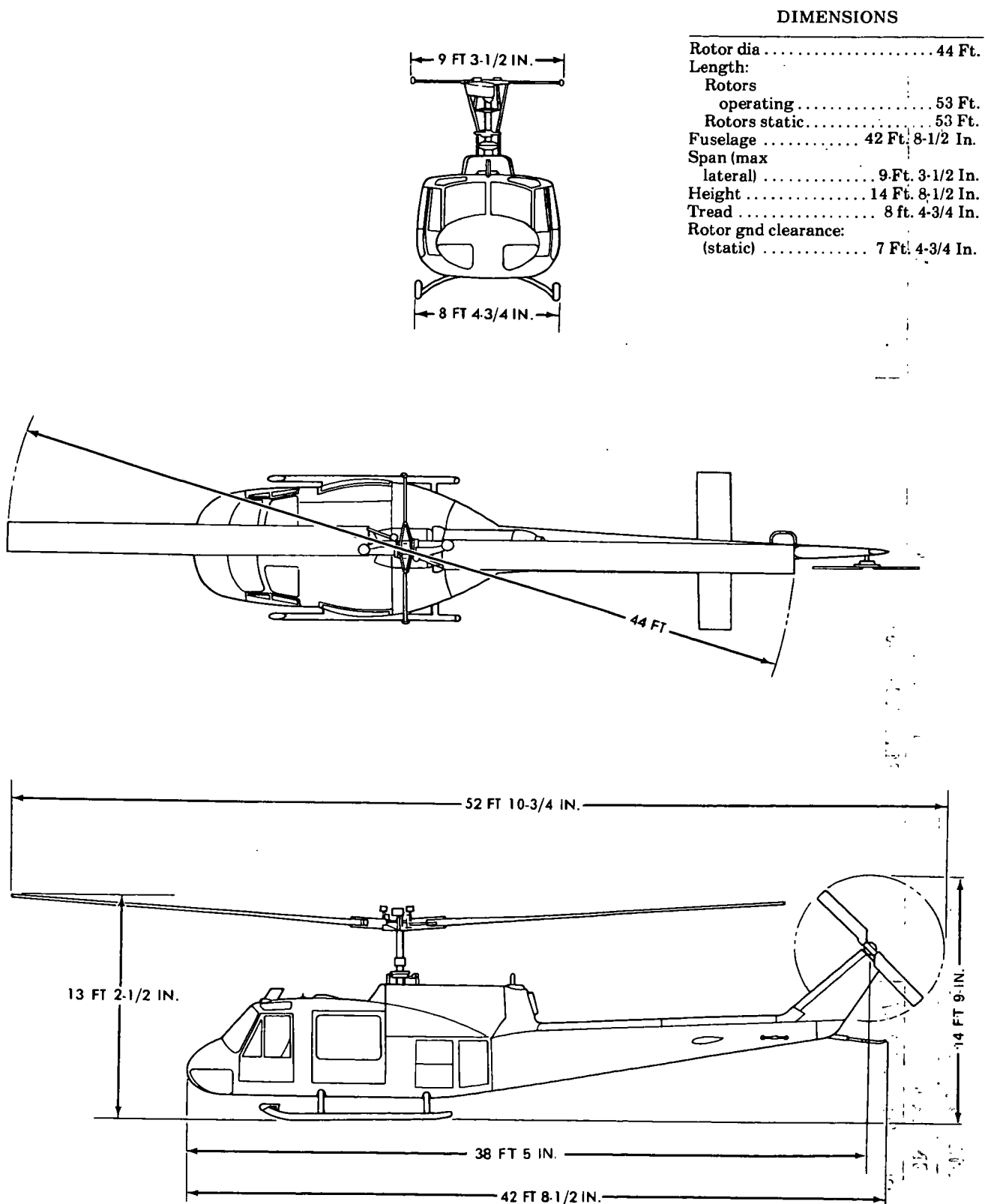


Figure 1-24. Principal Dimensions, UH-1B (Iroquois)

1-44. UH-1B (Iroquois) Characteristics:

ENGINE				MISSION AND DESCRIPTION		WEIGHTS	
No. & Model.....(1) T-53-L-11C/-11D				Mfr's Model: Bell 204		Empty (calculated) 4557	
Mfr Lycoming				The principal missions of the UH-1B are the transport of personnel, special teams or crews, equipment, supplies, and to serve as an aerial weapons platform. Universal pylons are attachable to the aircraft to serve as mounts for weapons or external fuel tanks. It may also be used for medical evacuation and as an instrument trainer. These missions may be performed from prepared or unprepared takeoff and landing areas, under instrument operations including light icing, and day or night flight. The gas-turbine-powered UH-1B is of compact design having a low silhouette. The two-bladed main rotor and the two-bladed tail rotor are of all-metal construction. The fuselage is of semimonocoque construction. Sliding cabin doors allow straight-through loading. Litters may be loaded from either side or both sides simultaneously. The cargo floor is knee-high to facilitate loading. The copilot's controls are removable, thus providing accommodations for a passenger in the copilot's seat or, when the copilot's seat is removed, additional cargo area. Some UH-1B's, have complete provisions for a variable speed, power-driven hoist supported by a swing boom, capable of lifting personnel or up to 600 pounds of cargo.		Basic 4825	
Type Free power turbine						Design 6600 3.0	
Red. gear ratio . 0.3119						Combat *6596 3.0	
Tailpipe Fixed area						Max takeoff 8500 2.3	
Augmentation . None						Max landing 8500	
ENGINE RATINGS						*For basic mission.	
T53-L 11C/D						FUEL AND OIL	
Rating/SL SHP SFC Output RPM						Fuel:	
Max (takeoff) 1100 0.682 6610						Grade JP-4/5	
Mil 1000 0.690 6610						Spec MIL-T-5624	
NRP 900 0.702 6610						No. tanks:	
						Fuselage (2) 165 gal	
						Ferry (1) 350 gal	
						Total qty 515 gal	
						Oil:	
						Spec MIL-L-7808	
						or MIL-L-23699	
						No. tanks 1	
						Location Fuselage	
						Qty 3-1/4 gal	
TECHNICAL PUBLICATION				DEVELOPMENT		AVIONICS / ARMAMENT	
AIRFRAME:				Date of contract December 1960		Refer to chapter 2.	
TM55-1520-219-10				First flight March 1960		FLYAWAY COSTS / NSN	
TM55-1520-219-20&34				First delivery December 1961		NSN-1520-00713-9912,	
TM55-1520-210-23P						LINE K31749, COST \$244,760	
TM55-1520-219-PMS				CAPACITIES			
TM55-1500-219-MTF				PERSONNEL			
ENGINE:				Inside clearance			
TM55-2840-229-24				Crew area:			
TM55-2840-229-23P				Length (overall) 4 ft			
DMWR 55-2840-113				Width (floor level) .. 6 ft, 8-1/2 in.			
				Height (max) 4 ft			
				Copilot area:			
				Length (overall) 4 ft, 7 in.			
				Width (floor level) .. 2 ft, 7 in.			
				Height (max) 4 ft			
				Main cargo door			
				Height (max) 4 ft			
				Width (max) 4 ft			
				Limit floor loads (overall)			
				Cargo area 300 lb/sq ft			
				Copilot area 75 lb/sq ft			
				Usable cubage			
				Cargo area 140 cu ft			
				Copilot area 20 cu ft			

1-45. Loading and Performance — Typical Missions, UH-1B (Iroquois).

CONDITIONS	TRANSPORT (CARGO OR PASSENGER)	ARMED ^{12/}	INSTRUMENT TRAINER	FERRY
TAKEOFF WEIGHT (lb) ...	6762	7500	6088 ^{5/}	8390 ^{6/}
Fuel at 6.5 lb/gal (grade JP-4) (lb) ...	1073	1073	1073 ^{7/}	3348 ^{7/}
Payload (outbound) (lb) ...	800	0	0	0
Payload (inbound) (lb) ...	0	0	0	0
Takeoff power loading ^{8/} (lb/bhp) ...	7.04	6.86	6.34	8.74
Disk loading (lb/sq ft) ...	4.45	4.35	4.00	5.52
Autorotation speed (min R/D) (kn) ...	57.0	56.5	55.6	60.1
Takeoff ground run at SL ^{1/} (ft) ...	0	0	0	0
Takeoff to clear 50 ft ^{1/} (ft) ...	0	0	0	0
Vertical rate of climb at SL ^{1/} (fpm) ...	1610	1780	2330	....
Maximum rate of climb at SL ^{2/} (fpm) ...	1910	2010	2300	1250
Speed for max R/C at SL (kn) ...	57.0	56.5	55.6	60.1
Time: SL to 5000 ft ^{2/} (min) ...	2.7	2.5	2.3	4.6
Time: SL to 10,000 ft ^{2/} (min) ...	6.0	5.4	4.9	 ^{11/}
Service ceiling (100 fpm) ^{2/} (ft) ...	18,000	17,000	20,200	8800
Absolute hovering ceiling ^{1/} (ft) ...	11,500	12,400	14,900	....
COMBAT RANGE ^{10/} (nmi) ...	230	210	218	695
Average cruise speed (kn) ...	106	90	106	103.4
Initial cruising altitude (ft) ...	2000-4000	2000-4000	2000-4000	2000-4000
Final cruising altitude (ft) ...	2000-4000	2000-4000	2000-4000	2000-4000
Total mission time (hr) ...	2.25	2.45	2.12	6.88
COMBAT RADIUS ^{10/} (nmi) ...	112.7	94.5	98.8	....
Average cruise speed (kn) ...	106	90	106	....
Cruising altitude (outbound) (ft) ...	2000-4000	2000-4000	2000-4000	....
Cruising altitude (inbound) (ft) ...	2000-4000	2000-4000	2000-4000	....
Total mission time (hr) ...	2.22	2.4	1.95	....
FIRST LANDING WEIGHT ^{3/} (lb) ...	6253	6145	5631	....
Ground roll at SL (ft) ...	0	0	0	....
Total from 50 ft (ft) ...	0	0	0	....
COMBAT WEIGHT ^{3/} (lb) ...	5453	7241	5631	5377
Combat altitude (ft) ...	2000-4000	2000-4000	2000-4000	2000-4000
Combat speed (kn) ...	106	100	106	106
Combat climb ^{2/} (fpm) ...	2190	1590	2050	2220
Combat ceiling (500 ft/min) ^{2/} , ^{12/} (ft) ...	22,400	15,400	21,400	22,600

1-45 Loading and Performance - Typical Missions, UH-1B (Iroquois) (CONT.)

CONDITIONS	TRANSPORT (CARGO OR PASSENGER)	7,000-8,000 ARMED ^{12/}	INSTRUMENT TRAINER	5,000-4,000 FERRY
Service ceiling (100 ft/min) ^{2/} ^{12/} (ft)	23,100	16,000	22,200	23,250
Absolute hovering ceiling ^{1/} ^{12/} (ft)	18,200	9000	16,800	18,500
Takeoff ground run at SL ^{1/} (ft)	0	0	0	0
Takeoff to clear 50 ft ^{1/} (ft)	0	0	0	0
Maximum rate of climb at SL ^{2/} (fpm)	2740	1740	2620	2810
Speed for max R/C at SL (kn)	54.2	58.0	54.6	54.1
Max speed at SL ^{4/} (kn)	120	105	120	120
Basic speed at 5000 ft ^{4/} (kn)	117.5	100	117.5	117.5
LANDING WEIGHT ^{3/} (lb)	4996	5639	5188	5377
Ground roll at SL (ft)	0	0	0	0
Total from 50 ft (ft)	0	0	0	0

- ^{1/} Takeoff power.
- ^{2/} Normal rated power.
- ^{3/} For RADIUS mission if radius is shown.
- ^{4/} V_{ne} limit.
- ^{5/} Includes crew of 2 at 400 lb.
- ^{6/} Includes crew of 1 at 200 lb.
- ^{7/} Includes 1 x 350 gallon tank.
- ^{8/} Based on engine specification takeoff shaft horsepower available.
- ^{9/} Three 250-lb litter patients.
- ^{10/} Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-33.
- ^{11/} Above service ceiling.
- ^{12/} Armed W/M-21 subsystem.

Performance Basis:

- a. Power required based on FTC-TDR-62-21, "YUH-1B Category II Performance Tests."
- b. Power available and fuel flow are based on Lycoming Model Specification No. 104. 16-B.
- c. All data are at 6600 engine rpm.
- d. Except for Ferry Mission, data do not include ground effect.

1-46. Performance Notes, UH-1B (Iroquois).

FORMULA: RADIUS MISSION I

Warm up, take off, climb on course to 2000-4000 feet at normal power, proceed at cruise speeds to remote base, and land. Without refueling, warm up, take off, climb on course to 2000-4000 feet at normal power, and return at cruise speeds. Range-free allowances are 4 minutes of normal power for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION II

Warm up, take off, climb on course to 2000-4000 feet at normal power, proceed at cruise speeds to remote base, and land. Without refueling, warm up, take off, climb on course to 2000-4000 feet at normal power, and return at cruise speeds. Range-free allowances are 4 minutes of normal power for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, takeoff, climb on course to 2000-4000 feet at normal power, proceed at cruise speeds to remote base, and land. Without refueling, warm up, take off, climb on course to 2000-4000 feet at normal power, and return at cruise speed. Range-free allowances are 10 minutes of normal power for warmups and takeoffs plus 20 minutes at speeds for maximum endurance at sea level, plus 5 percent of initial fuel for reserve.

Source: DRSTS-WU

FORMULA: RANGE MISSION II

Warm up, take off, climb on course to 2000-4000 feet at normal power, and proceed at cruise speeds until 90 percent of initial fuel is consumed. Range-free allowances are 2 minutes of normal power for warmup and takeoff plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Warm up, take off, climb on course to 2000-4000 feet initial altitude at normal power, proceed at cruise speeds to remote base, and land. Range-free allowances are 5 minutes of normal power for warmup and takeoff, plus 20 minutes at speeds for maximum endurance at sea level, plus 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSION IV

Warm up, take off, climb on course to 2000-4000 feet initial altitude at normal power, maintain 30 feet per minute rate of climb to final altitude of 2000-4000 feet, and proceed at cruise speeds until 90 percent of initial fuel is consumed. Range-free allowances are 2 minutes of normal power for warmup and takeoff plus 10 percent of initial fuel for reserve.

GENERAL NOTES

a. Cruise speed as used above denotes airspeed for long-operation or maximum permissible speed, whichever is lower.

b. Except for ferry mission takeoff, data do not include ground effect.

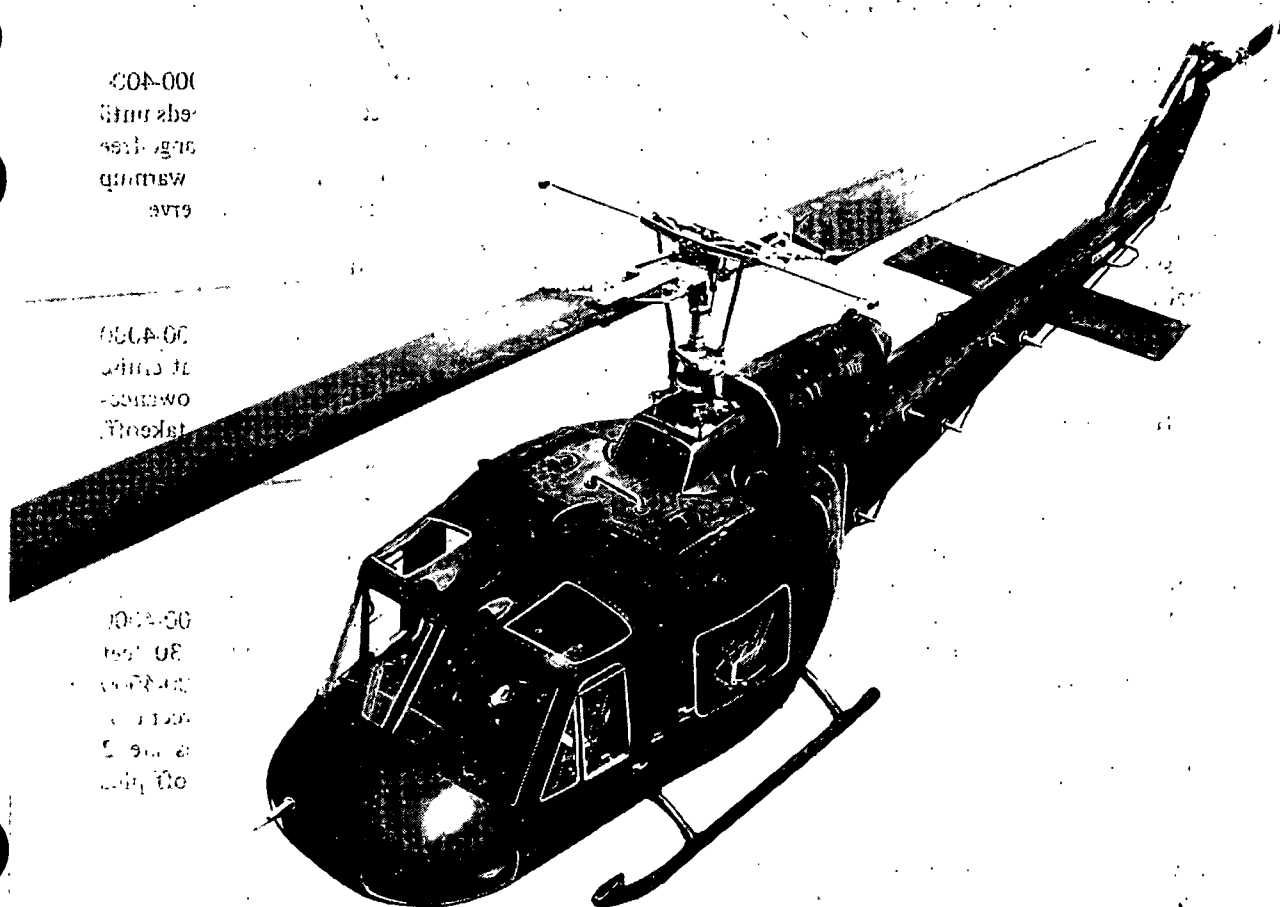


Figure 1-25 UH-1C and M, (Iroquois), typical

DIMENSIONS

Rotor dia	44 Ft.
Length:	
Rotors	
operating	53 Ft.
static	53 Ft.
Fuselage	42 Ft. 8 In.
Span (max	
lateral)	9 Ft. 1/2 In.
Height	14 Ft. 9 In.
Tread	8 Ft. 4-1/2 In.
Rotor gnd clearance:	
(static)	7 Ft. 4-1/2 In.

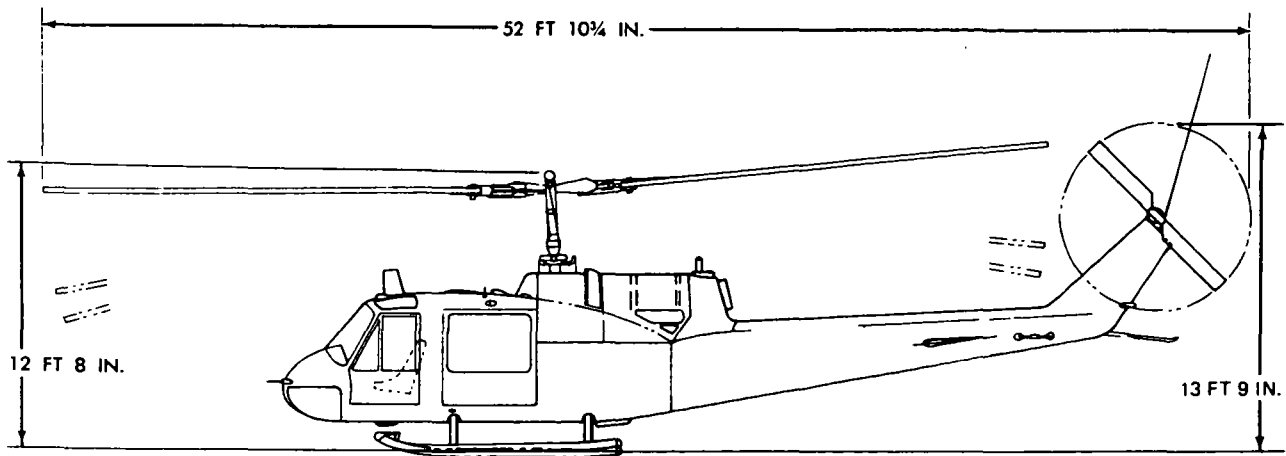
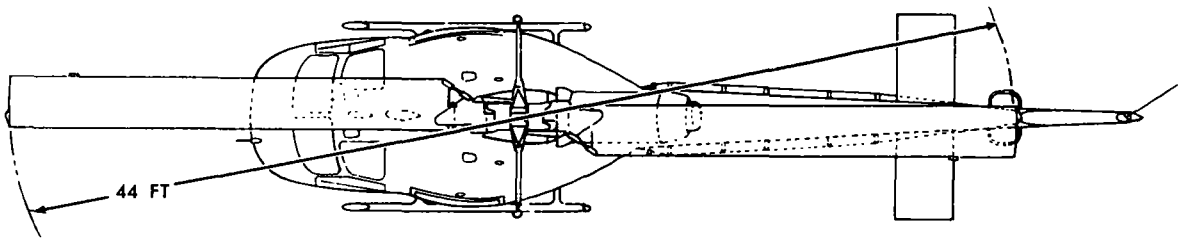
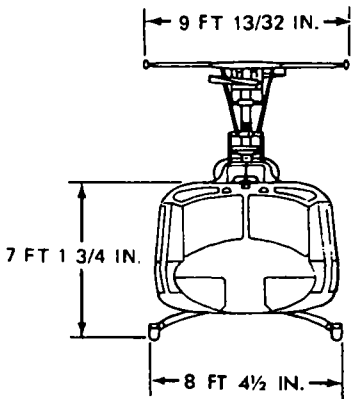


Figure 1-26. Principal Dimensions, UH-1C (Iroquois)

1-47 UH-1C (Iroquois) Characteristics.

ENGINE				MISSION AND DESCRIPTION		WEIGHTS	
No. & model (1) T53-L-11C/D				Mfr's Model: Bell		LB L.F.	
Mfr Lycoming				The principal missions of the UH-1C helicopter are transporting personnel, special teams or crews, equipment and supplies; medical evacuation; ambulance service; reconnaissance and security; point target and area fire by attachment of appropriate weapons; and instrument trainer. These missions may be performed from prepared or unprepared takeoff and landing areas, under instrument operations including light icing, and day or night flight. Navigation may be by dead reckoning or by use of radio aids. The main difference between the UH-1C and UH-1B is the main rotor system. The UH-1C has the 540 rotor system which has a flexure plate, hinge-half type hub and a wider chord blade. The 540 rotor system provides a more stable gun platform, higher maximum gross weight, and higher forward speed. Some UH-1C's have complete provisions for a variable speed, power driven hoist supported by a swing boom, capable of lifting personnel or up to 600 pounds of cargo.		Empty 4830	
Engine spec No . . . 104.22-B & .28						Gross 9500	
Type Free power turbine						FUEL AND OIL	
Red. gear ratio . . . 0.3119							
Tailpipe Fixed area						Fuel:	
Augmentation None						Grade JP-4/5	
ENGINE RATINGS				Spec MIL-T-5624		Qty 242 gal	
T53-L-11C/D				Oil:		Spec MIL-L-7808 or MIL-L-23699	
Rating/SL	SHP	SFC	Output RPM	DEVELOPMENT		Qty-Engine 4 gal	
Max (takeoff)	1100	0.682	6610	Contracting agency AVSCOM		Qty-Transmission and gear boxes 2.8 gal	
Mil	1000	0.690	6610	Delivery schedule June 1965 thru November 1967		AVIONICS / ARMAMENT	
NRP	900	0.702	6610			Refer to chapter 2.	
TECHNICAL PUBLICATION				CAPACITIES		PERSONNEL	
AIRFRAME:				Crew (pilot and medical attendant) 2		FLYAWAY COSTS / NSN	
TM55-1520-220-10				Litters 3			
TM55-1520-220-20&34				Transport mission		NSN, 1520-00997-8862, Line K31767, Cost, \$224,415	
TM55-1520-210-23P				Crew 1			
TM55-1520-220-PMS				Passengers 4			
TM55-1500-219-MTF				Alternate			
				Crew 1			
ENGINE:				Passengers 7			
TM55-2840-229-23P				Trainer			
TM55-2840-229-24				Crew (instructor & student) 2			
DMWR 55-2840-113				Ferry			
				Crew 1			

1-48. Performance — Typical Mission, UH-1C (Iroquois).

Takeoff distance	(ft)	0
Rate of climb	(fpm)	2,420
Service ceiling	(ft)	21,100
Cruise speed ¹ /.....	(kn)	92-110
Max speed	(kn)	140
Range	(nmi)	300
Landing distance	(ft)	0

¹/Normal rated power (6600 rpm) at sea level.

Source: DRSTS-WU

DIMENSIONS

Rotor dia	44 Ft.
Length:	
Rotors	
operating	53 Ft.
static	53 Ft.
Fuselage	42 Ft. 8 In.
Span (max	
lateral)	9 Ft. 1/2 In.
Height	14 Ft. 9 In.
Tread	8 Ft. 4-1/2 In.
Rotor gnd clearance:	
(static)	7 Ft. 4-1/2 In.

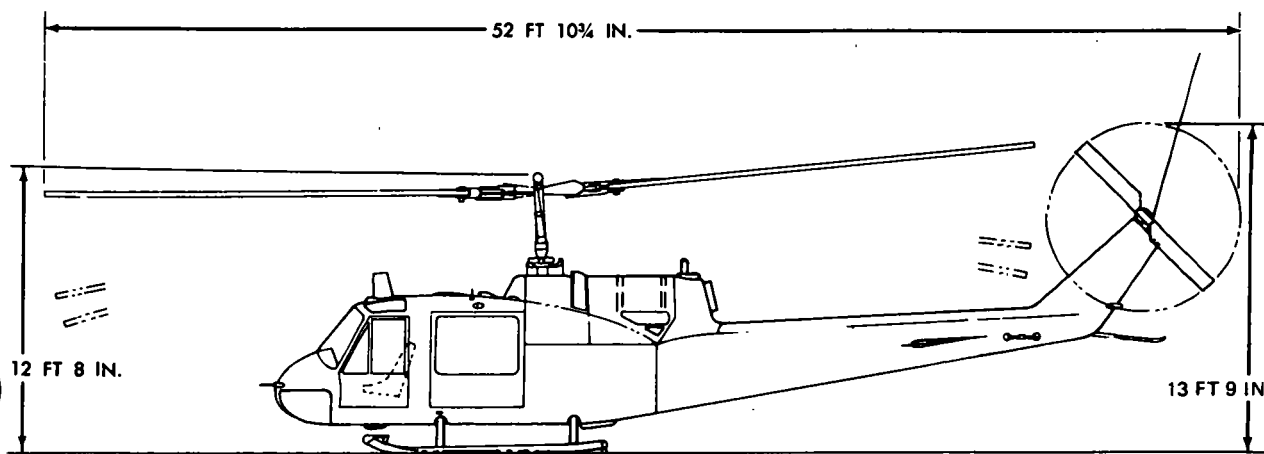
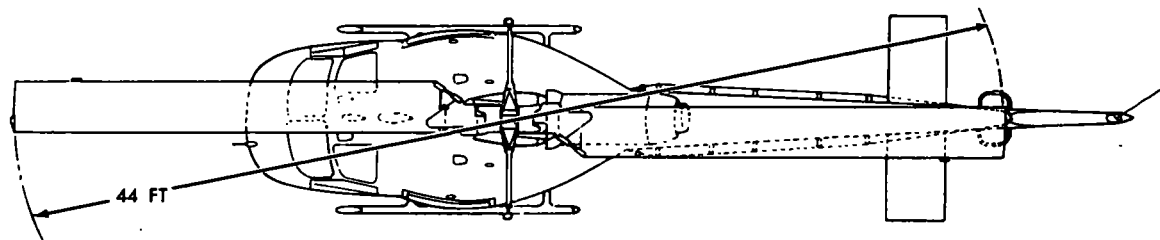
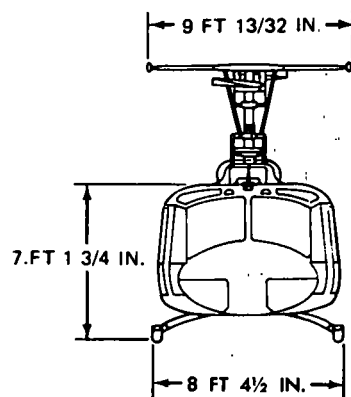


Figure 1-27. Principal Dimensions, UH-1M (Iroquois)

1-49. UH-1M (Iroquois) Characteristics.

ENGINE				MISSION AND DESCRIPTION		WEIGHTS	
No. & model (1) T53-L-13B Mfr Lycoming Engine spec No . . . 104.22-B & .28 Type Free power turbine Red. gear ratio . . . 0.3119 Tailpipe Fixed area Augmentation None				Mfr's Model: Bell The principal missions of the UH-1M helicopter are transporting personnel, special teams or crews, equipment and supplies; medical evacuation; ambulance service; reconnaissance and security; point target and area fire by attachment of appropriate weapons; and instrument trainer. These missions may be performed from prepared or unprepared takeoff and landing areas, under instrument operations including light icing, and day or night flight. Navigation may be by dead reckoning or by use of radio aids. The main difference between the UH-1M and UH-1C is the T53-L-13. The UH-1M has the 540 rotor system which has a flexure plate, hinge-half type hub and a wider chord blade. The 540 rotor system provides a more stable gun platform, higher maximum gross weight, and higher forward speed. Some UH-1Ms have complete provisions for a variable speed, power driven hoist supported by a swing boom, capable of lifting personnel or up to 600 pounds of cargo.		LB	L.F.
						Empty	4830
						Gross	9500
						FUEL AND OIL	
ENGINE RATINGS				Fuel:		Grade JP-4/5	
T53-L-13B Rating/SL SHP SFC RPM Max (takeoff) 1100 0.682 6610 Mil 1000 0.690 6610 NRP 900 0.702 6610				Spec MIL-T-5624		Qty 242 gal	
				Oil:		Spec MIL-L-7808 or MIL-L-23699	
				Qty-Engine 4 gal		Qty-Transmission and gear boxes 2.8 gal	
				DEVELOPMENT		Contracting agency AVSCOM	
TECHNICAL PUBLICATION				Delivery schedule June 1965 thru November 1967		AVIONICS / ARMAMENT	
AIRFRAME: TM55-1520-220-10 TM55-1520-220-20&34 TM55-1520-210-23P TM55-1520-220-PMS TM55-1500-219-MTF ENGINE: TM55-2840-229-23 TM55-2840-229-23P DMWR 55-2840-113				CAPACITIES		PERSONNEL	
				Cargo area: Length (overall) . . 4 ft Width (floor level) 6 ft. 8-1/2 in. Height (max) . . . 4 ft		Basic mission Crew (pilot and medical attendant) 2 Litters 3	
				Transport mission Crew 1 Passengers 4		Alternate Crew 1 Passengers 7	
				Trainer Crew (instructor & student) 2		Ferry Crew 1	
				Limit floor loads (overall) Cargo area 300 lb/sq ft Copilot area 75 lb/sq ft Usable cubage Cargo area 140 cu ft Copilot area 20 cu ft			

1-50. Performance — Typical Mission, UH-1M (Iroquois).

Takeoff distance	(ft)	0
Rate of climb	(fpm)	2,420
Service ceiling	(ft)	21,100
Cruise speed ^{1/}	(kn)	92-110
Max speed	(kn)	140
Range	(nmi)	300
Landing distance	(ft)	0

^{1/}Normal rated power (6600 rpm) at sea level.

Source: DRSTS-WU

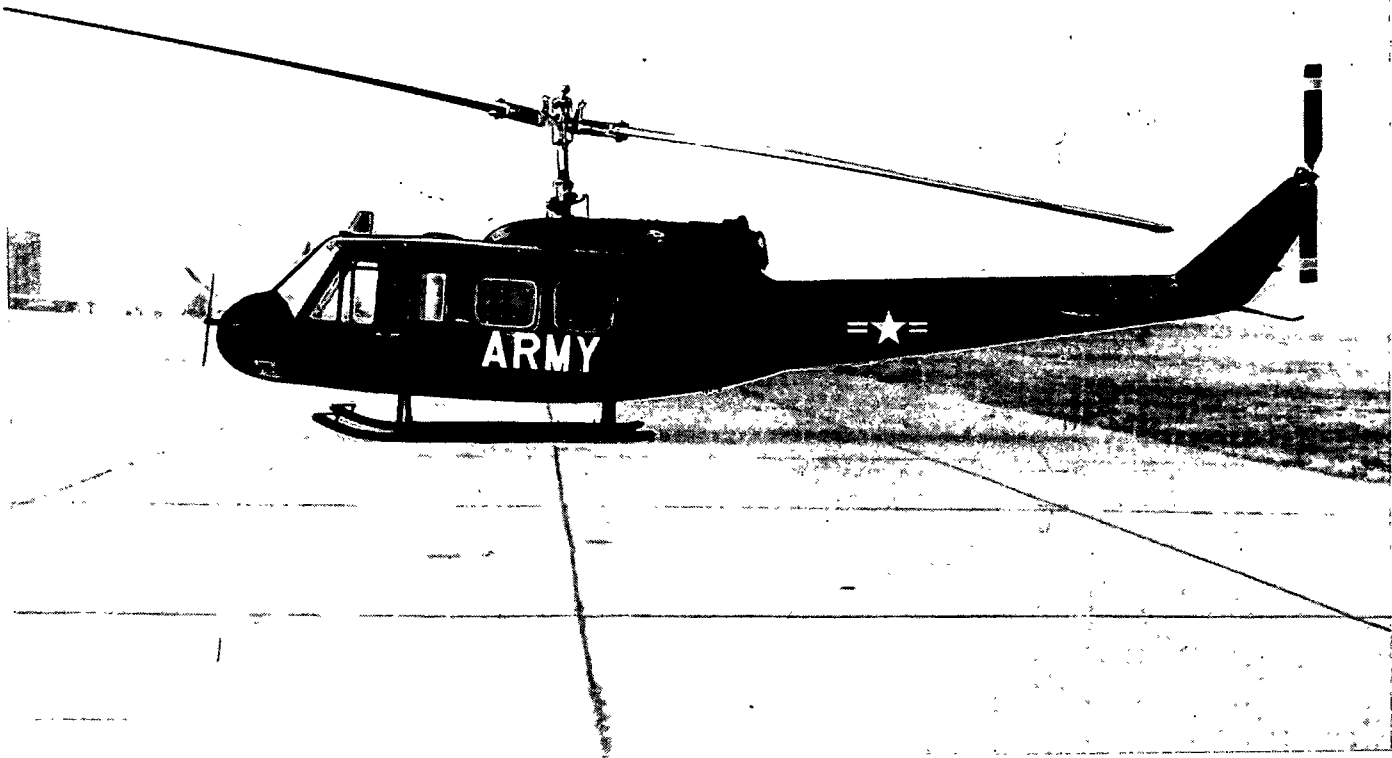


Figure 1-28 UH-1D, H, V, (Iroquois), typical

DIMENSIONS

Rotor dia	48 Ft.
Length:	
Rotors	
operating	57 Ft. 1 In.
static	57 Ft. 1 In.
Fuselage	41 Ft. 11-1/4 In.
Span (max lateral).....	9 Ft. 4 In.
Height	14 Ft. 5-1/2 In.
Tread	8 Ft. 6-1/2 In.
Gnd clearance (static, against stops).....	6 Ft. 6 In.

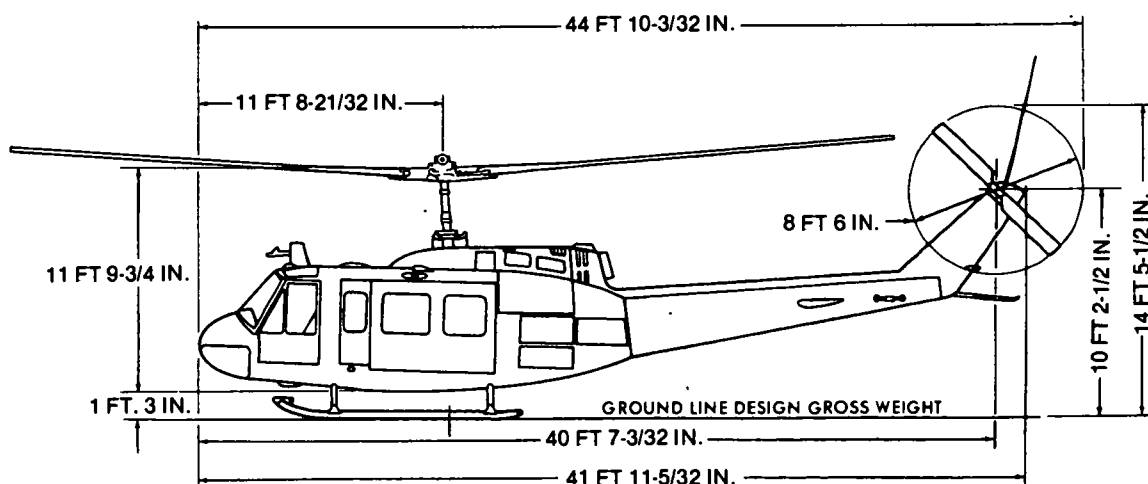
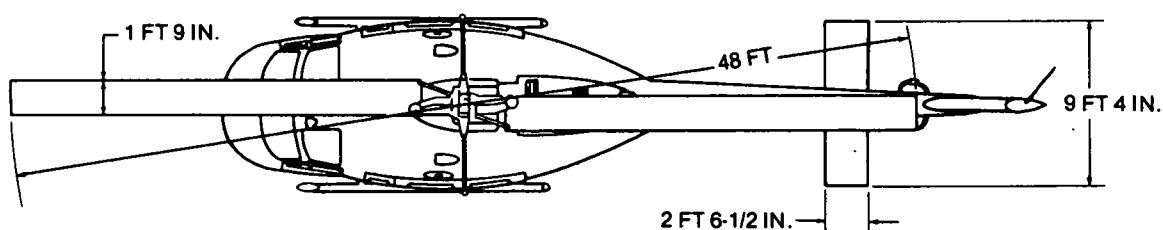
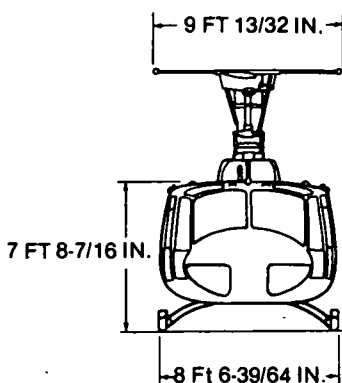


Figure 1-29. Principal Dimensions, UH-1D and H (Iroquois)

1-51. UH-1D (Iroquois) Characteristics.

ENGINE		MISSION AND DESCRIPTION		WEIGHTS	
No. & model .. (1)T53-L-11C/D		Mfr's Model: Bell 205		LB L.F.	
Mfr Lycoming		The missions of the UH-1D include transportation of personnel, equipment and supplies, medical evacuation, delivery of protective fire by attachment of appropriate weapons, and instrument training. These missions may be performed from prepared or unprepared takeoff and landing areas, under instrument operations including light icing, and day or night flight. The UH-1D is of compact design having a low silhouette. The semimonocoque fuselage is of all-metal construction as are the tail rotor blades and the two main rotor blades. The sliding doors along each side of the cabin allow simplified straight-through loading from either side or both sides simultaneously. This capability is especially useful while loading or unloading litter patients. The knee-high cargo floor also contributes to loading ease. Since the copilot's controls are removable, an extra passenger can be carried. If the copilot's seat is also removed, an extra 8.75 square feet of cargo area is gained. Some UH-1D's have complete provisions for a variable speed, power-driven hoist supported by a swing boom, capable of lifting personnel or 600 pounds of cargo while hovering. Retrofit of a crashworthy fuel system with closed circuit refueling capability is being accomplished on the UH-1D aircraft.		Empty (calculated) 5098	
Engine spec No 104.28 & 22-B				Design 6600 3.0	
Type Free power turbine				Combat 9500 2.2	
Red. gear ratio . 0.312				Max takeoff 9500 2.2	
Tailpipe Fixed area				Max landing 9500	
Augmentation .. None					
ENGINE RATINGS				FUEL AND OIL	
T53-L-11C/D				Fuel:	
Rating	SHP SFC RPM			Grade JP-4/5	
Max (takeoff)	1100 0.682 6610			Spec MIL-T-5624	
Mil	1000 0.690 6610			No. tanks:	
NRP	900 0.702 6610			Fuselage (2) 209 gal	
				Ferry (1) 300 gal	
				Total qty 509 gal	
TECHNICAL PUBLICATION		CAPACITIES	PERSONNEL	Oil:	
AIRFRAME:		Inside clearance	Basic mission	Spec MIL-L-7808	
TM55-1500-219-MTF		Cargo area:	Crew 1	or	
TM55-1510-210-10		Length (overall) .. 7 ft, 8 in.	Passengers 4	MIL-L-23699	
TM55-1510-210-20		Width (floor level) 8 ft	Alternate	No. tanks 1	
TM55-1510-210-34		Height (max) 4 ft, 1 in.	Crew 1	Location Fuselage	
TM55-1520-220-PMS		Copilot area:	Passengers 12	Qty 4-1/2 gal	
TM55-1510-210-PM		Length (overall) .. 3 ft, 7 in.	Litter evacuation		
		Width 2 ft, 7 in.	Crew (pilot & medical attendant) 2	AVIONICS / ARMAMENT	
		Height (max) 4 ft	Litters 6	Refer to chapter 2.	
		Main cargo door	Cargo	FLYAWAY	
		Height 4 ft	Crew 1	NSN 1520-00859-2670,	
		Width (max) 6 ft, 2-1/2 in.	Ferry mission	LINE, K31786, COST, \$237,504	
		Height above ground 2 ft	Crew (pilot & copilot) 2		
		Limit floor loads			
		Cargo area 300 lb/sq ft			
		Copilot area 75 lb/sq ft			
		Usable cubage			
		Capacity			
		Cargo area 220 cu ft			
		Copilot area 20 cu ft			
ENGINE:					
TM55-2840-229-23					
TM55-2840-229-23P					
DMWR 55-2840-113					

1-52. Loading and Performance — Typical Missions, UH-1D (Iroquois).

CONDITIONS	BASIC (PERSONNEL CARRIER)	TRANSPORT (CARGO OR TROOP)	LITTER EVACUATION	FERRY
TAKEOFF WEIGHT (lb) ...	7334 ^{6/}	8954 ^{6/}	6930 ^{5/}	8795 ^{5/}
Fuel at 6.5 lb/gal (grade JP-4) (lb) ...	1359	1359	1359	3309 ^{7/}
Payload (outbound) (lb) ...	800	2420	0	0
Payload (inbound) (lb) ...	0	0	1500 ^{9/}	0
Takeoff power loading ^{8/} (lb/SHP) ...	6.66	8.14	6.30	7.99
Disk loading (lb/sq ft) ...	4.05	4.95	3.83	4.86
Autorotation speed (min R/D) (kn) ...	51.7	55.5	50.9	55.1
Takeoff ground run at SL (6600 rpm) ^{1/} (ft) ...	0	0	0	0
Takeoff to clear 50 ft (6600 rpm) ^{1/} (ft) ...	0	0	0	0
Vertical rate of climb at SL (6600 rpm) ^{1/} (fpm) ...	1620	420	1960	580
Maximum rate of climb at SL ^{2/} (fpm) ...	1730	1220	1880	1260
Speed for max R/C at SL (kn) ...	51.7	55.5	50.9	55.1
Time: SL to 5000 ft ^{2/} (min) ...	2.9	4.1	2.6	4
Time: SL to 10,000 ft ^{2/} (min) ...	6.2	9.8	5.6	9.3
Service ceiling (100 fpm) ^{2/} (ft) ...	20,900	14,900	22,400	15,200
Absolute hovering ceiling (6600 rpm) ^{1/} (ft) ...	10,100	2300	12,200	3000
COMBAT RANGE ^{10/} (nmi) ...	305.4	259	....	705.0
Average cruise speed (kn) ...	102	99	....	103
Cruising altitude (initial) (ft) ...	2000-4000	2000-4000	....	2000-4000
Cruising altitude (final) (ft) ...	2000-4000	2000-4000	....	2000-4000
Total mission time (hr) ...	2.99	2.62	....	6.87
COMBAT RADIUS ^{10/} (nmi) ...	149	134	143.3	....
Average cruise speed (kn) ...	105.4	103.5	103.5	....
Cruising altitude (outbound) (min/max) (ft) ...	2000-4000	2000-4000	2000-4000	....
Cruising altitude (inbound) (ft) ...	2000-4000	2000-4000	2000-4000	....
Total mission time (hr) ...	2.92	2.7	2.34	....
FIRST LANDING WEIGHT ^{3/} (lb) ...	6655	8220	6320	....
Ground roll at SL (6600 rpm) (ft) ...	0	0	0	....
Total from 50 ft (6600 rpm) (ft) ...	0	0	0	....
COMBAT WEIGHT ^{3/} (lb) ...	5855	5800	7800	5753
Combat altitude (ft) ...	2000-4000	2000-4000	2000-4000	2000-4000
Combat speed ^{4/} (kn) ...	110	110	118	110
Combat climb ^{2/} (fpm) ...	2020	2040	1520	2070
Combat ceiling (500 ft/min) ^{2/} (ft) ...	25,000	25,200	16,200	25,400
Service ceiling (100 ft/min) ^{2/} (ft) ...	26,900	27,000	18,900	27,200
Absolute hovering ceiling (6600 rpm) ^{1/} (ft) ...	17,600	17,800	7600	18,100
Takeoff ground run at SL (6600 rpm) ^{1/} (ft) ...	0	0	0	0

1-52. Loading and Performance — Typical Missions, UH-1D (Iroquois) (CONT).

CONDITIONS	BASIC (PERSONNEL CARRIER)	TRANSPORT (CARGO OR TROOP)	LITTER EVACUATION	FERRY
Takeoff to clear 50 ft (6600 rpm) ^{1/} (ft) ...	0	0	0	0
Maximum rate of climb at SL ^{2/} (fpm) ...	2360	2400	1560	2420
Speed for max R/C at SL (kn) ...	48.8	48.7	52.8	48.6
Max speed at SL ^{4/} (kn) ...	120	120	117.5	120
Basic speed at 5000 ft ^{4/} (kn) ...	119	119	118	119
LANDING WEIGHT ^{3/} (lb) ...	5247	5247	7143	5753
Ground roll at SL (6600 rpm) (ft) ...	0	0	0	0
Total from 50 ft (6600 rpm) (ft) ...	0	0	0	0

^{1/} Takeoff power.^{2/} Normal rated power.^{3/} For RADIUS mission if radius is shown.^{4/} V_{ne} limit.^{5/} Includes crew of 2 at 400 lb.^{6/} Includes crew of 1 at 200 lb.^{7/} Includes two 150-gallon ferry tanks.^{8/} Based on engine specification takeoff shaft horsepower.^{9/} Six 250-pound litter patients.^{10/} Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-38.

Performance Basis:

- Power required based on Bell Model 204B FAA Flight Test.
- Power available and fuel flow based on Lycoming Model Specification No. 104.28.
- All data are at 6400 rpm unless otherwise noted.

1-53. Performance Notes, UH-1D (Iroquois).**FORMULA: RADIUS MISSION I**

Warm up, take off, climb on course to 2000-4000 feet initial altitude at normal rated power, proceed at long range cruise speed to remote base, land, and unload passengers. Without refueling, warm up, take off, climb on course to 2000-4000 feet at normal rated power, and return at long range cruise speed. Range-free allowances are 4 minutes at normal rated power for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION II

Warm up, take off, and climb on course to 2000-4000 feet at normal rated power. Cruise climb on course at long range cruise speed to final altitude of 2000-4000 feet. Proceed at long range speed to remote base, land, and unload cargo or troops. Without refueling, warm up, take off, climb on course to 2000-4000 feet at normal rated power, and return at long range cruise speed. Range-free allowances are 4 minutes at normal rated power for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, and climb on course to 2000-4000 feet at normal rated power. Proceed at long range cruise speed to remote base, land, and pick up litter patients. Without refueling, warm up, take off,

climb on course to 2000-4000 feet at normal rated power, and return at long range cruise speed. Range-free allowances are 4 minutes at normal rated power for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION I

Warm up, take off, and climb on course to 2000-4000 feet initial altitude at normal rated power. Proceed at long range cruise speed to remote base and land. Range-free allowances are 2 minutes at normal rated power for warmup and takeoff plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION II

Warm up, take off, and climb on course to 2000-4000 feet at normal rated power. Cruise climb on course at long range cruise speed to final altitude of 2000-4000 feet. Proceed at long range cruise speed to remote base and land. Range-free allowances are 2 minutes at normal rated power for warmup and takeoff plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Warm up, take off, and climb on course to 2000-4000 feet at normal power. Cruise climb on course at long range cruise speed to final altitude of 2000-4000 feet. Proceed at long range cruise speed to remote base and land. Range-free allowances are 2 minutes at normal rated power for warmup and takeoff plus 10 percent of initial fuel for reserve.

Source: DRSTS-WU

1-54. UH-1H (Iroquois) Characteristics.

ENGINE		MISSION AND DESCRIPTION		WEIGHTS	
No. & model (1) T53-L-13B		Mfr's Model: Bell 205		LB L.F.	
Mfr Lycoming		The UH-1H is a modified UH-1D with the T53-L-13 turbine engine. The basic description and mission are the same for both aircraft. The advantages over the UH-1D are takeoff distance, rate of climb, range, endurance, and overall mission capabilities. All future production of the UH-1D will be the UH-1H model. Some UH-1H's have complete provisions for a variable speed, power-driven hoist supported by a swing boom, capable of lifting personnel or up to 600 pounds of cargo while hovering. Production and retrofit of a crashworthy fuel system with closed circuit refueling capability is being accomplished on the UH-1D/H aircraft.		Empty 5132	
Type 104.33				Design 6600 3.0	
Red. gear ratio . . 0.312				Combat 9500 2.2	
Tailpipe Fixed area				Max takeoff 9500 2.2	
Augmentation . . . None				Max landing 9500	
ENGINE RATINGS				FUEL AND OIL	
T53-L-13B				Fuel:	
Rating/SL	SHP	SFC	RPM	Grade JP-4/5	
Mil	1400*	0.580	6300	Spec MIL-T-5624	
NRP	1250*	0.598	6040	No. tanks:	
* 1400 SHP flat rated to 1100 SHP.				Fuselage (2) 209 gal	
				Ferry (1) 300 gal	
				Total qty 509 gal	
				Oil:	
				Spec MIL-L-23699	
				or	
				MIL-L-7808	
				No. tanks 1	
				Location Fuselage	
				Qty 4-1/2 gal	
TECHNICAL PUBLICATION		CAPACITIES	PERSONNEL	AVIONICS / ARMAMENT	
AIRFRAME:		Inside clearance	Basic mission	Refer to chapter 2.	
TM55-1520-210-10		Cargo area:	Crew 1		
TM55-1520-210-23		Length (overall) . . 7 ft, 8 in.	Passengers 4	FLYAWAY COSTS / NSN	
TM55-1520-210-23P		Width (floor level) 8 ft	Alternate	NSN 1520-00087-7637, LINE, K31795, COST \$618,055	
TM55-1520-210-PMS		Height (max) 4 ft, 1 in.	Crew 1		
TM55-1500-219-MTF		Copilot area:	Passengers 12		
TM55-1500-210-PM		Length (overall) . . 3 ft, 7 in.	Litter evacuation		
		Width 2 ft, 7 in.	Crew (pilot & medical attendant) 2		
		Height (max) 4 ft	Litters 6		
		Main cargo door	Cargo		
		Height (max) 4 ft	Crew 1		
		Width (max) 6 ft, 2-1/2 in.	Ferry mission		
		Height above ground 2 ft	Crew (pilot & copilot) 2		
		Limit floor loads			
		Cargo area 300 lb/sq ft			
		Copilot area 75 lb/sq ft			
		Usable cubage			
		Capacity:			
		Cargo area 220 cu ft			
		Copilot area 20 cu ft			

1-55. Loading and Performance — Typical Missions, UH-1H (Iroquois).

CONDITIONS	BASIC (PERSONNEL CARRIER)	TRANSPORT (CARGO OR TROOP)	LITTER EVACUATION	FERRY
TAKEOFF WEIGHT (lb)	7644 <u>6</u> /	9264 <u>6</u> /	7414 <u>5</u> /	9305 <u>5</u> /
Fuel at 6.5 lb/gal (grade JP-4) (lb)	1370	1370	1370	3320 <u>7</u> /
Payload (outbound) (lb)	800	2420	0	0
Payload (inbound) (lb)	0	0	1500 <u>9</u> /	0
Takeoff power loading <u>8</u> / (lb/SHP)	6.94	8.42	6.74	8.45
Disk loading (lb/sq ft)	4.22	5.11	4.10	5.14
Autorotation speed (min R/D) (kn)	61	65	60	65
Takeoff ground run at SL (6600 rpm) <u>1</u> / (ft)	0	0	0	0
Takeoff to clear 50 ft (6600 rpm) <u>1</u> / (ft)	0	0	0	0
Vertical rate of climb at SL (6600 rpm) <u>1</u> / (fpm)	1620	420	1960	580
Maximum rate of climb at SL <u>2</u> / (fpm)	1653	1126	1691	1112
Speed for max R/C at SL (kn)	61	65	60	65
Time: SL to 5000 ft <u>2</u> / (min)	3.1	4.6	2.9	4.1
Time: SL to 10,000 ft ² (min)	6.2	9.9	5.9	10.2
Service ceiling (100 fpm) <u>2</u> / (ft)	18,340	13,960	19,140	13,640
Absolute hovering ceiling (6600 rpm) <u>1</u> / (ft)	14,800	4000	16,000	3600
COMBAT RANGE <u>10</u> / (nmi)	275	250	....	676
Average cruise speed (kn)	111	105	....	110
Cruising altitude (initial) (ft)	2000-4000	2000-4000	....	2000-4000
Cruising altitude (final) (ft)	2000-4000	2000-4000	....	2000-4000
Total mission time (hr)	2.46	2.37	....	6.13
COMBAT RADIUS <u>10</u> / (nmi)	141	124	133	....
Average cruise speed (kn)	111	107	121	....

1-55. Loading and Performance — Typical Missions, UH-1H (Iroquois) (CONT).

CONDITIONS	BASIC (PERSONNEL CARRIER)	TRANSPORT (CARGO OR TROOP)	LITTER EVACUATION	FERRY
Cruising altitude (outbound) (min/max) (ft)	2000-4000	2000-4000	2000-4000	.....
Cruising altitude (inbound) (ft)	2000-4000	2000-4000	2000-4000	.....
Total mission time (hr)	2.73	2.54	2.38	.....
FIRST LANDING WEIGHT ^{3/} (lb)	6997	8584	6789	.....
Ground roll at SL (6600 rpm) (ft)	0	0	0	.....
Total from 50 ft (6600 rpm) (ft)	0	0	0	.....
COMBAT WEIGHT ^{3/} (lb)	6197	6164	8289	6316
Combat altitude (ft)	2000-4000	2000-4000	2000-4000	2000-4000
Combat speed ^{4/} (kn)	116	116	120	116
Combat climb ^{2/} (fpm)	2256	2276	1370	2200
Combat ceiling (500 ft/min) ^{2/} (ft)	23,550	23,694	15,960	23,150
Service ceiling (100 ft/min) ^{2/} (ft)	24,070	24,210	16,842	23,680
Absolute hovering ceiling (6600 rpm) ^{1/} (ft)	21,300	21,400	11,600	20,700
Takeoff ground run at SL (6600 rpm) ^{1/} (ft)	0	0	0	0
Takeoff to clear 50 ft (6600 rpm) ^{1/} (ft)	0	0	0	0
Maximum rate of climb at SL ^{2/} (fpm)	2232	2251	1399	2178
Speed for max R/C at SL (kn)	55.9	55.8	62.0	56.1
Max speed at SL ^{4/} (kn)	120	120	120	120
Basic speed at 5000 ft ^{4/} (kn)	120	120	120	120
LANDING WEIGHT ^{3/} (lb)	6977	8584	6789	6316
Ground roll at SL (6600 rpm) (ft)	0	0	0	0
Total from 50 ft (6600 rpm) (ft)	0	0	0	0

1-55. Loading and Performance — Typical Missions, UH-1H (Iroquois) (CONT).

- 1/ Takeoff power.
- 2/ Normal rated power.
- 3/ For RADIUS mission if radius is shown.
- 4/ V_{ne} limit.
- 5/ Includes crew of 2 at 400 lb.
- 6/ Includes crew of 1 at 200 lb.
- 7/ Includes two 150-gallon ferry tanks.
- 8/ Based on engine specification takeoff shaft horsepower.
- 9/ Six 250-pound litter patients.
- 10/ Detailed descriptions of RADIUS and RANGE missions are same as shown in paragraph 1-38.

Performance Basis:

- a. Reference operator's Manual Army Model UH-1D H Helicopter TM 55-1520-210-10.
- b. All data are at 6600 rpm unless otherwise noted.

Source: DRSTS-WU

DIMENSIONS

Rotor dia	48 Ft.
Length:	
Rotors	
operating	57 Ft. 1 In.
Rotors static	57 Ft. 1 In.
Fuselage	41 Ft. 11 1/4 In.
Span (max	
lateral)	9 Ft. 4 In.
Height	14 Ft. 5-1/2 In.
Tread	8 Ft. 6-1/2 In.
Gnd clearance	
(static, against	
stops)	6 Ft. 6 In.

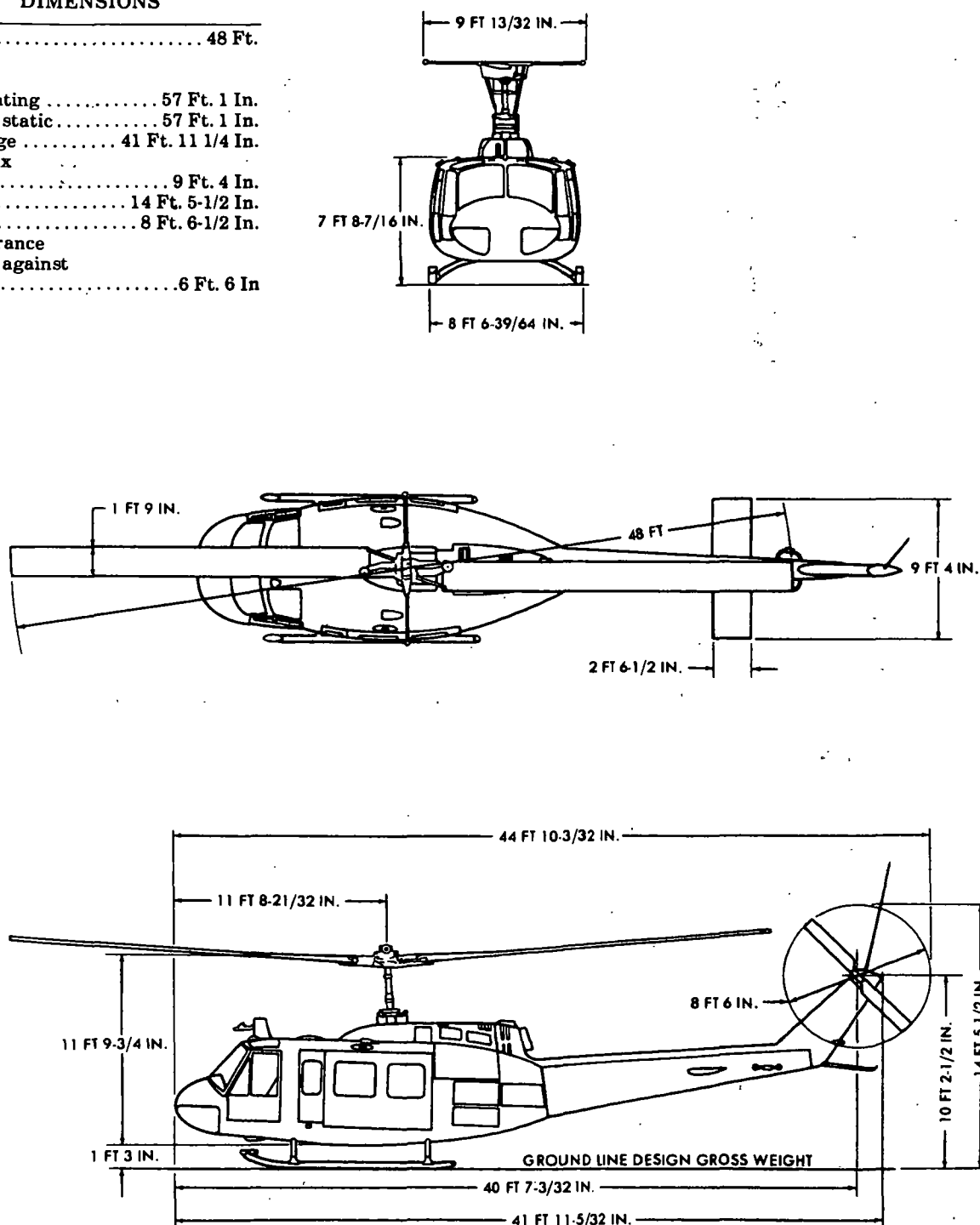


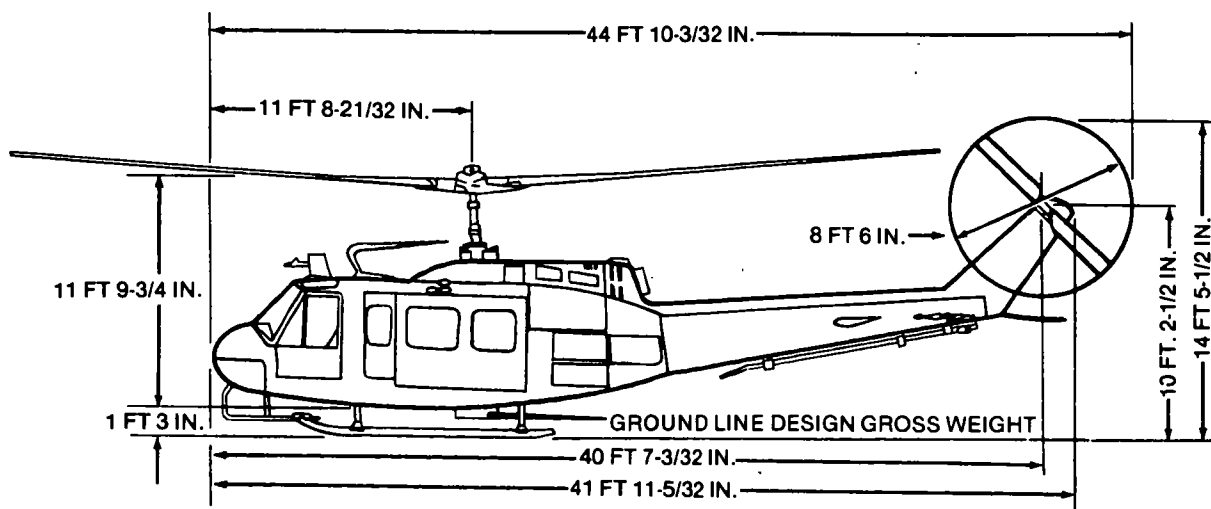
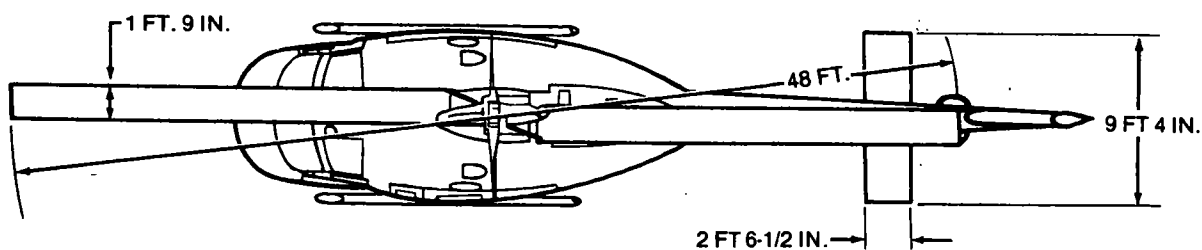
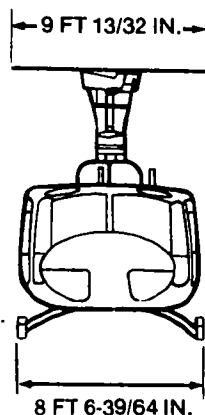
Figure 1-30. Principal Dimensions, UH-1V (Iroquois)

1-56. UH-1V (Iroquois) Characteristics.

ENGINE		MISSION AND DESCRIPTION		WEIGHTS	
No. & model (1) T53-L-13B		Mfr's Model: Bell 205		LB L.F.	
Mfr Lycoming		The UH-1V is a UH-1H converted to a medical evacuation aircraft, the only difference in the conversion is installation of DME and a radar altimeter. This aircraft will be furnished all med evac units.		Empty 5132	
Type 104.33				Design 6600 3.0	
Red. gear ratio . . 0.312				Combat 9500 2.2	
Tailpipe Fixed area				Max takeoff 9500 2.2	
Augmentation . . . None				Max landing 9500	
ENGINE RATINGS		DEVELOPMENT			
T53-L-13B		First flight (Similar aircraft)			
Rating/SL		First acft delivered Mar 79			
SHP					
SFC					
RPM					
Mil					
NRP					
1400* 0.580 6300					
1250* 0.598 6040					
* 1400 SHP flat rated to 1100 SHP.					
TECHNICAL PUBLICATION		CAPACITIES		PERSONNEL	
AIRFRAME:		See Page 1-91.		See Page 1-91.	
TM1500-219-MTF					
TM55-1520-210-10					
TM55-1520-210-23 & 34					
TM55-1520-210-23P					
TM55-1520-210-PMS					
TM55-1520-210-PM					
ENGINE:					
TM55-2840-229-23					
TM55-2840-229-23P					
DMWR 55-2840-113					
				FUEL AND OIL	
				Fuel:	
				Grade JP-4/5	
				Spec MIL-T-5624	
				No. tanks:	
				Fuselage (2) 209 gal	
				Ferry (1) 300 gal	
				Total qty 509 gal	
				Oil:	
				Spec MIL-L-23699	
				or	
				MIL-L-7808	
				No. tanks 1	
				Location Fuselage	
				Qty 4-1/2 gal	
				AVIONICS / ARMAMENT	
				Refer to chapter 2.	
				FLYAWAY COSTS / NSN	
				NSN, 1520-01043-4949, Line, COST \$618,055	

DIMENSIONS

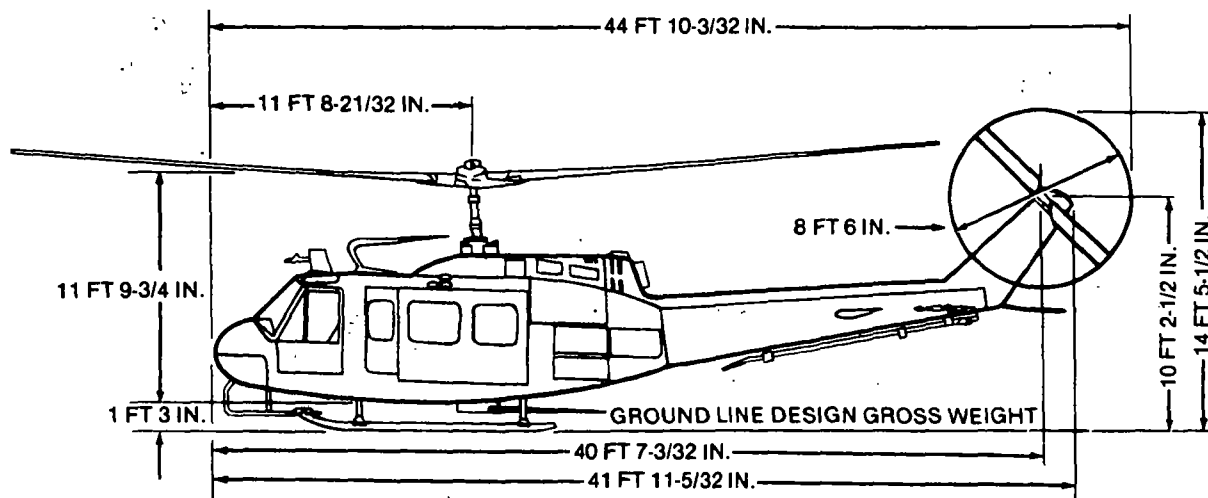
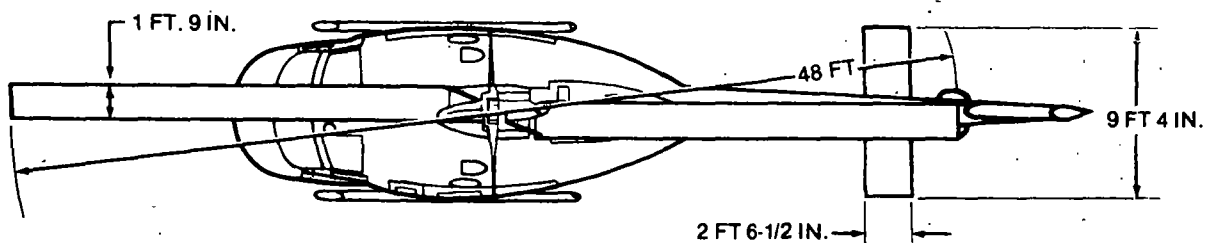
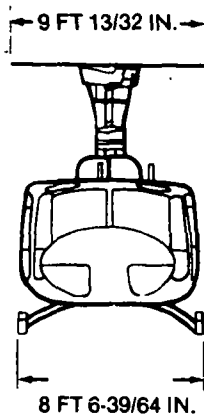
Rotor dia	48 Ft.
Length:	
Rotors	
operating	57 Ft. 1 In.
Rotors Static	57 Ft. 1 In.
Fuselage	41 Ft. 11-1/4 In.
Span (max	
Lateral)	9 Ft. 4 In.
Height	14 Ft. 5-1/2 In.
Tread	8 Ft. 6-1/2 In.
Gnd clearance	
(static, against	
stops)	6 Ft. 6 In.



ENGINE		MISSION AND DESCRIPTION		WEIGHTS	
No. & model	(1)T53-L-13B	The EH-1H is a modified UH-1H configured to carry ECM equipment in the passenger/cargo area. The basic dynamic components and airframe are the same as the standard aircraft. The mission for the EH-1H weapon system consists of air-borne search, collection and jamming countermeasures of enemy single channel radio communications. This information is provided to Division/Brigade commanders in tactical situations. Recording/Reproducing capability is also included in the information collection system.		Empty	LB L.F.
Mfr	Lycoming			Design	6258
Type	104.33			Combat	9500
Red. gear ratio . .	0.312			Max takeoff	9500
Tailpipe	Fixed area			Max landing	9500
Augmentation . .	None				
ENGINE RATINGS				FUEL AND OIL	
T53-L-13B		DEVELOPMENT		Fuel:	
Rating/SL	SHP			Grade JP-4/5	
	Output			Spec MIL-T-5624	
Mil	1400*			No. tanks:	
NRP	1250*			Fuselage (2) 209 gal	
	0.580 6300			Ferry (1) 300 gal	
	0.598 6040			Total qty 509 gal	
* 1400 SHP flat rated to 1100 SHP.				Oil:	
TECHNICAL PUBLICATION				Spec MIL-L-23699	
AIRFRAME:				or	
TM55-1500-219-MTF				MIL-L-7808	
TM55-1520-210-10				No. tanks 1	
TM55-1520-210-20 & 34				Location Fuselage	
TM55-1520-210-23P				Qty 4-1/2 gal	
TM55-1520-210-PMS				AVIONICS / ARMAMENT	
ENGINE:				Refer to chapter 2.	
TM55-2840-229-23				FLYAWAY COSTS / NSN	
TM55-2840-229-23P				NSN, 1520-00368-8442	
DMWR 55-2840-113				LINE K 30548	
				COST, \$1.920.000	

DIMENSIONS

Rotor dia	48 Ft.
Length:	
Rotors	
operating	57 Ft. 1 In.
Rotors Static.....	57 Ft. 1 In.
Fuselage.....	41 Ft 11-1/4 In.
Span (max	
Lateral)	9 Ft. 4 In.
Height	14 Ft. 5-1/2 In.
Tread	8 Ft. 6-1/2 In.
Gnd clearance	
(static, against	
stops).....	6 Ft. 6 In.



1-103

FM 101-20

1-59. Loading and Performance — Typical Missions, UH-1V, EH-1H and EH-1X (Iroquois).

CONDITIONS	BASIC (PERSONNEL CARRIER)	TRANSPORT (CARGO OR TROOP)	LITTER EVACUATION	FERRY
TAKEOFF WEIGHT (lb)	7644 <u>6/</u>	9264 <u>6/</u>	7414 <u>5/</u>	9305 <u>5/</u>
Fuel at 6.5 lb/gal (grade JP-4) (lb)	1370	1370	1370	3320 <u>7/</u>
Payload (outbound) (lb)	800	2420	0	0
Payload (inbound) (lb)	0	0	1500 <u>9/</u>	0
Takeoff power loading <u>8/</u> (lb/SHP)	6.94	8.42	6.74	8.45
Disk loading (lb/sq. ft)	4.22	5.11	4.10	5.14
Autorotation speed (min R/D) (kn)	61	65	60	65
Takeoff ground run at SL (6600 rpm) <u>1/</u> (ft)	0	0	0	0
Takeoff to clear 50 ft (6600 rpm) <u>1/</u> (ft)	0	0	0	0
Vertical rate of climb at SL (6600 rpm) <u>1/</u> (fpm)	1620	420	1960	580
Maximum rate of climb at SL <u>2/</u> (fpm)	1653	1126	1691	1112
Speed for max R/C at SL (kn)	61	65	60	65
Time: SL to 5000 ft <u>2/</u> (min)	3.1	4.6	2.9	4.1
Time: SL to 10,000 ft <u>2</u> (min)	6.2	9.9	5.9	10.2
Service ceiling (100 fpm) <u>2/</u> (ft)	18,340	13,960	19,140	13,640
Absolute hovering ceiling (6600 rpm) <u>1/</u> (ft)	14,800	4000	16,000	3600
COMBAT RANGE <u>10/</u> (nmi)	275	250	.....	676
Average cruise speed (kn)	111	105	.....	110
Cruising altitude (initial) (ft)	2000-4000	2000-4000	.....	2000-4000
Cruising altitude (final) (ft)	2000-4000	2000-4000	.....	2000-4000
Total mission time (hr)	2.46	2.37	.....	6.13
COMBAT RADIUS <u>10/</u> (nmi)	141	124	133	.....
Average cruise speed (kn)	111	107	121	.....

1-59. Loading and Performance — Typical Missions, UH-1V, EH-1H and EH-1X (Iroquois) (CONT).

CONDITIONS	BASIC (PERSONNEL CARRIER)	TRANSPORT (CARGO OR TROOP)	LITTER EVACUATION	FERRY
Cruising altitude (outbound) (min/max) (ft)	2000-4000	2000-4000	2000-4000	.....
Cruising altitude (inbound) (ft)	2000-4000	2000-4000	2000-4000	.....
Total mission time (hr)	2.73	2.54	2.38	.....
FIRST LANDING WEIGHT ^{3/} (lb)	6997	8584	6789	.....
Ground roll at SL (6600 rpm) (ft)	0	0	0	.....
Total from 50 ft (6600 rpm) (ft)	0	0	0	.....
COMBAT WEIGHT ^{3/} (lb)	6197	6164	8289	6316
Combat altitude (ft)	2000-4000	2000-4000	2000-4000	2000-4000
Combat speed ^{4/} (kn)	116	116	120	116
Combat climb ^{2/} (fpm)	2256	2276	1370	2200
Combat ceiling (500 ft/min) ^{2/} (ft)	23,550	23,694	15,960	23,150
Service ceiling (100 ft/min) ^{2/} (ft)	24,070	24,210	16,842	23,680
Absolute hovering ceiling (6600 rpm) ^{1/} (ft)	21,300	21,400	11,600	20,700
Takeoff ground run at SL (6600 rpm) ^{1/} (ft)	0	0	0	0
Takeoff to clear 50 ft (6600 rpm) ^{1/} (ft)	0	0	0	0
Maximum rate of climb at SL ^{2/} (fpm)	2232	2251	1399	2178
Speed for max R/C at SL (kn)	55.9	55.8	62.0	56.1
Max speed at SL ^{4/} (kn)	120	120	120	120
Basic speed at 5000 ft ^{4/} (kn)	120	120	120	120
LANDING WEIGHT ^{3/} (lb)	6977	8584	6789	6316
Ground roll at SL (6600 rpm) (ft)	0	0	0	0
Total from 50 ft (6600 rpm) (ft)	0	0	0	0

1-59. Loading and Performance — Typical Missions, UH-1V, EH-1H and EH-1X (Iroquois) (CONT).

- 1/ Takeoff power.
- 2/ Normal rated power.
- 3/ For RADIUS mission if radius is shown.
- 4/ V_{ne} limit.
- 5/ Includes crew of 2 at 400 lb.
- 6/ Includes crew of 1 at 200 lb.
- 7/ Includes two 150-gallon ferry tanks.
- 8/ Based on engine specification takeoff shaft horsepower.
- 9/ Six 250-pound litter patients.
- 10/ Detailed descriptions of RADIUS and RANGE missions are same as shown in paragraph 1-38.

Performance Basis:

- a. Reference operator's Manual Army Model UH-1D H Helicopter TM 55-1520-210-10.
- b. All data are at 6600 rpm unless otherwise noted.

1-60. Performance Notes, UH-1V, EH-1H and EH-1X (Iroquois).

FORMULA: RADIUS MISSION I

Warm up, take off, climb on course to 2000-4000 feet initial altitude at normal rated power, proceed at long range cruise speed to remote base, land, and unload passengers. Without refueling, warm up, take off, climb on course to 2000-4000 feet at normal rated power, and return at long range cruise speed. Range-free allowances are 4 minutes at normal rated power for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION II

Warm up, take off, and climb on course to 2000-4000 feet at normal rated power. Cruise climb on course at long range cruise speed to final altitude of 2000-4000 feet. Proceed at long range speed to remote base, land, and unload cargo or troops. Without refueling, warm up, take off, climb on course to 2000-4000 feet at normal rated power, and return at long range cruise speed. Range-free allowances are 4 minutes at normal rated power for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, and climb on course to 2000-4000 feet at normal rated power. Proceed at long range cruise speed to remote base, land, and pick up litter patients. Without refueling, warm up, take off,

climb on course to 2000-4000 feet at normal rated power, and return at long range cruise speed. Range-free allowances are 4 minutes at normal rated power for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION I

Warm up, take off, and climb on course to 2000-4000 feet initial altitude at normal rated power. Proceed at long range cruise speed to remote base and land. Range-free allowances are 2 minutes at normal rated power for warmup and takeoff plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION II

Warm up, take off, and climb on course to 2000-4000 feet at normal rated power. Cruise climb on course at long range cruise speed to final altitude of 2000-4000 feet. Proceed at long range cruise speed to remote base and land. Range-free allowances are 2 minutes at normal rated power for warmup and takeoff plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Warm up, take off, and climb on course to 2000-4000 feet at normal power. Cruise climb on course at long range cruise speed to final altitude of 2000-4000 feet. Proceed at long range cruise speed to remote base and land. Range-free allowances are 2 minutes at normal rated power for warmup and takeoff plus 10 percent of initial fuel for reserve.

**Source: DRSTS-WU
DRCPM-AEL**



Figure 1-33. UH-60A (Blackhawk)

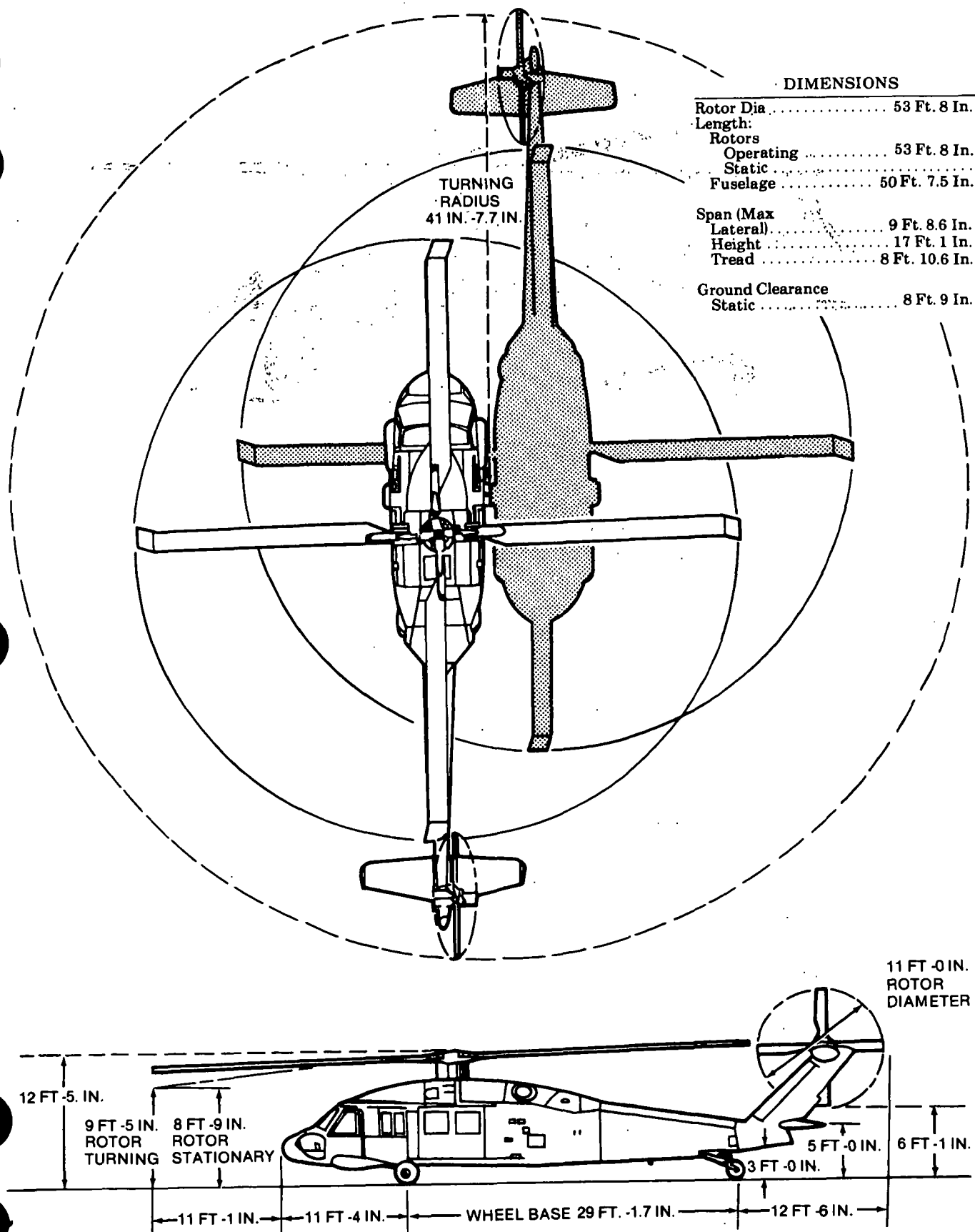


Figure 1-34. UH-60A (Blackhawk)

1-61. UH-60A (Blackhawk) Characteristics

ENGINE	MISSION AND DESCRIPTION		WEIGHTS
No. & model .. (2) T700-GE-700 Mfr..... General Electric Engine spec. no. .. DARCOM-CP-2222-02000 Type Turboshaft Length..... 46.5 In. Width..... 25 In. Height 23 In. Weight..... 415 Lbs.	The Blackhawk helicopter will perform primary and secondary missions of transporting internal loads under visual and instrument conditions day and night and external loads under visual flight conditions. The Blackhawk (UH-60A) is a twin engine rotary wing aircraft which will carry eleven (11) combat equipped troops and a crew of three (3). Optional seating allows up to 14 combat equipped troops. When used as an aerial medical evacuation vehicle it will accomodate 4 litter patients and a medical attendant. An external cargo hook with 8,000 lbs. load capacity and provisions for an internal high performance rescue hoist are also provided. The UH-60A is designed to operate in temperatures from -65°F to +125°F.		LOADING LB Empty..... 10,500 Design Gross..... 16,450 Max Alternate..... 20,250
ENGINE RATINGS	DEVELOPMENT		FUEL AND OIL
Standard Sea Level Conditions SHP RPM Max Continuous 1240 20900 IRP 1543 20900	Date of Contract Nov 1976 First Flight (similar aircraft)..... Oct 1974 First Production Aircraft..... Aug 1978		Fuel: Grade JP-4 Spec MIL-T-5624 Alternate.... JP-5 Emergency .. No. Tanks 2 Location..... Rear Fuselage Qty 362 Gallons Oil: Engine Spec MIL-L-23699 Alternate.... MIL-L-7808 No. Tanks ... 1 Location..... Main Frame — Engine Transmission: Spec MIL-L-23699 Alternate.... MIL-L-7808
TECHNICAL PUBLICATION	CAPACITIES	PERSONNEL	AVIONICS/ ARMAMENT
AIRFRAME: TM55-1520-237-10 TM55-1520-237-23 TM55-1520-237-23-1 TM55-1520-237-23-2 TM55-1520-237-23-3 TM55-1520-237-23-4 TM55-1520-237-23-5 TM55-1520-237-23-6 TM55-1520-237-23-7 TM55-1520-237-23-8 TM55-1520-237-23-9 TM55-1520-237-23-10 TM55-1520-237-23P TM11-1520-237-23-1 TM11-1520-237-23-2 TM11-1520-237-23-3 ENGINE: TM55-2840-248-23 TM55-2840-248-23P	Cargo Apartment Floor Length 110" Length (including crew chief station) 151" Width 72" Height 53.5" Cargo Door Height 54" Width 68"	Crew 3 Troops..... 11 (optional troop seatings).... 14 Litters..... 4 Attendant 1	Refer to chapter 2. 210 DVA FLYAWAY NSN 1520-01035-0266 LINE, K32293 COST \$

1-62. Loading & Performance¹ - Typical Missions, UH-60A (Black Hawk)

CONDITIONS	COMBAT ASSAULT SEA LEVEL		COMBAT ASSAULT 4000'/95°F		MAX ALT GROSS WT SEA LEVEL	MAX ALT GROSS WT 4000'/95°F	FERRY MISSION STD DAY
	11	14	11	14			
NO OF TROOPS/PAYLOAD							
² Estimated Gross Weight (lbs)	16700	17420	16700	17420	20250	20250	19500
Payload (Outbound) (lbs)	2640	3360	2640	3360	6195	6195	—
Payload (Inbound) (lbs)	0	0	0	0	3000	3000	—
V _{max} (IRP) (kts)	157	156	156	155	128 ⁴	129 ⁴	149
Max Cruise Speed (MCP) (kts)	150	149	137	136	121 ⁴	105 ⁴	143
V _{cruise} (Best Range) (kts)	130	130	135	135	100 ⁴	105 ⁴	126
Max Rate-of-Climb (IRP-V _{broc}) (fpm)	2735	2550	2010	1840	1645	1075	2045
Vert Rate-of-Climb (95% IRP) (fpm)	1515	1220	290	—	—	—	—
Service Ceiling (100 fpm) (ft)	18,000	17200	14000	13000	13700	9800	14600
Service Ceiling (Single Eng) (ft)	8700	7500	3600	2400	3000	—	4200
Hover Ceiling (Oge, IRP) (ft)	9800	8600	5000	4200	4800	—	5000
Hover Ceiling (2 ft Wheel Ht, IRP) (ft)	14800	13600	9200	8400	9600	4000	10400
³ Radius of Action (nm)	106	105	133	133	90 ⁴	110 ⁴	
Ferry Range (nm)							950

¹ Performance with IR Suppressor Installed.

² Empty Wt - 10500 lbs. Fixed Useful Load with Crew of 3 - 935 lbs

³ 8 Min Ground Time, 1 Min Hover, Climbout, V_{cruise}, 5 Min Noe at 40 Kts & Return with 30 Minute Reserve.

⁴ Outbound Payload is External 30ft² Equivalent Flat Plate Area

Source: AVRADCOM - DRCPM-BH



Figure 1-35. C-12A (Huron)

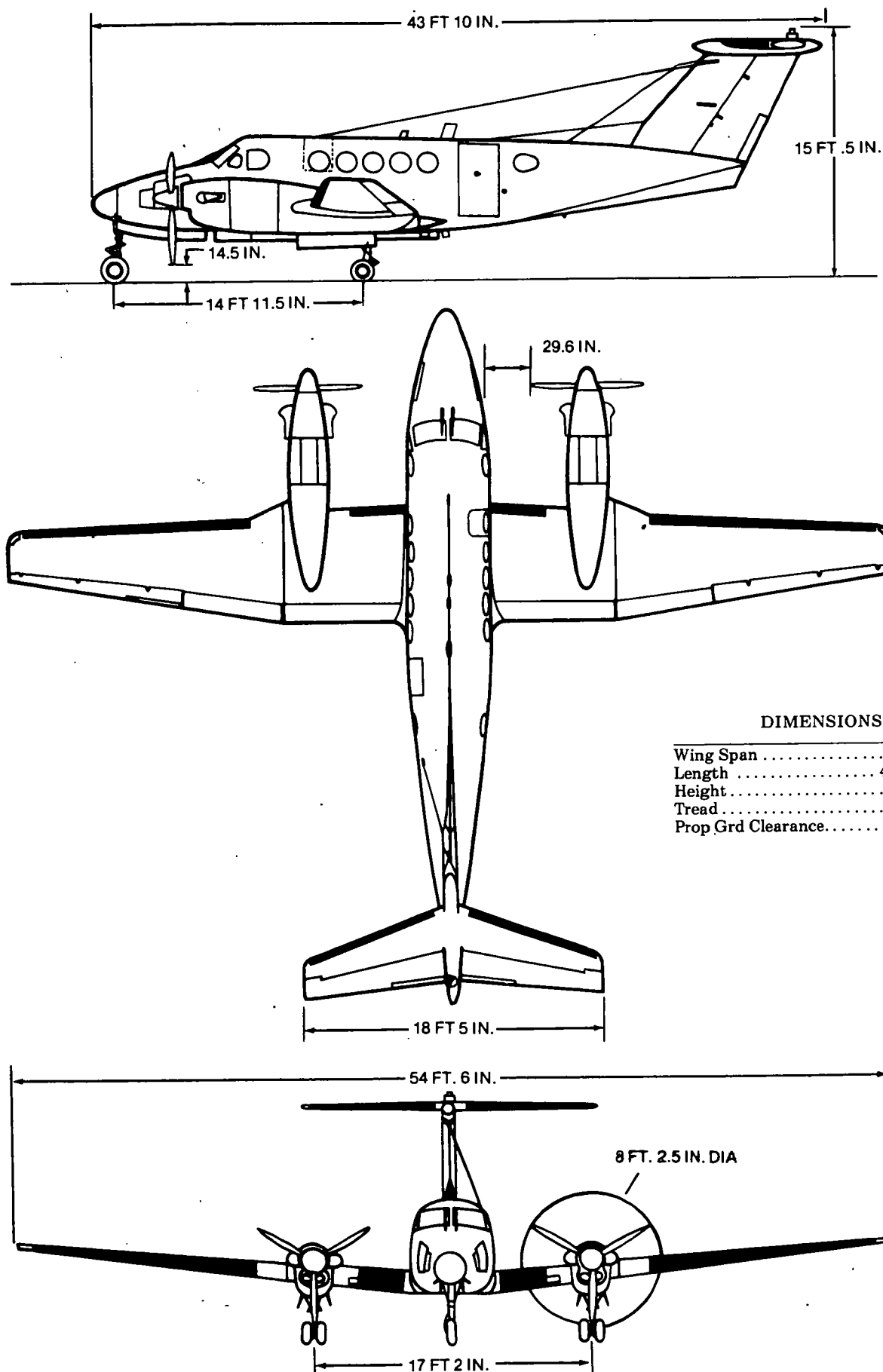


Figure 1-36. C-12A (Huron)

1-63. C-12A (Huron) Characteristics.

ENGINE	MISSION AND DESCRIPTION		WEIGHTS
No. and Model (2) PT6A-38 Mfr UACL Type Turbo Prop Prop Mfg. Hartzell Prop Type C5 No. Blades 3 Prop Dia. 8 ft. 2½ in.	Mfg. Model: Beech Aircraft Corp. A200 The C-12A is an off-the-shelf utility aircraft which is totally contractor supported. The C-12A is an all metal twin turbo prop engine, fixed wing, pressurized cabin, passenger/cargo carrying aircraft. The aircraft is designed and equipped for flight operations under Instrument Flight Rule (IFR) conditions day or night into high density air traffic control zones and into known icing weather conditions.		LOADING LB. Empty Basic Design 12,500 Combat Clean Light Scout Heavy Scout Hog Max. Takeoff Max. Landing 12,500
ENGINE RATINGS	DEVELOPMENT Date of contract Aug 1974 First flight (Similar aircraft) TSARCOM First acft delivered Sept 1975		FUEL AND OIL
TAKEOFF SHP 750 ALT SL			Fuel: Grade JP 4/5 Spec MIL-T-5624 No. tanks 12 Location 10 Wing 2 Nacelle Qty 386 (544 w/ Aux Tanks)
TECHNICAL PUBLICATIONS			Oil: Spec MIL-L-23699 No. tanks 2 Location Nacelle Qty 3.5 Gal Each Tank
AIRFRAME:	FEATURES	PERSONNEL	AVIONICS / ARMAMENT
Commercial Manuals (Contractor Supported)	All Metal T-Tail Retractable Tricycle with Dual Main Wheel Dual Side by Side Flight Controls	Crew 2 Passengers 8	Refer to chapter 2.
ENGINE:			FLYAWAY COSTS / NSN
Pratt and Whitney Commercial Manuals			NSN 1510-01005-5461 LIN A29676 COSTS, \$680,883

1-64. Performance — Typical Mission, C-12A (Huron).

Payload..... (LB)	4764
Range..... (NMI)	@31,000 1177 Aux Tanks 1780
Cruise Speed..... (KN)	@25,000 241 31,000 222
Max Speed..... (KN)	270
Min Takeoff Distance..... (FT)	3824
Min Landing Distance..... (FT)	2620
Rate of Climb (1 Eng)..... (FPM)	602
Service Ceiling (2 Eng)..... (Ft)	30,400
Service Ceiling (1 Eng)..... (Ft)	

Source: DRSTS-WP

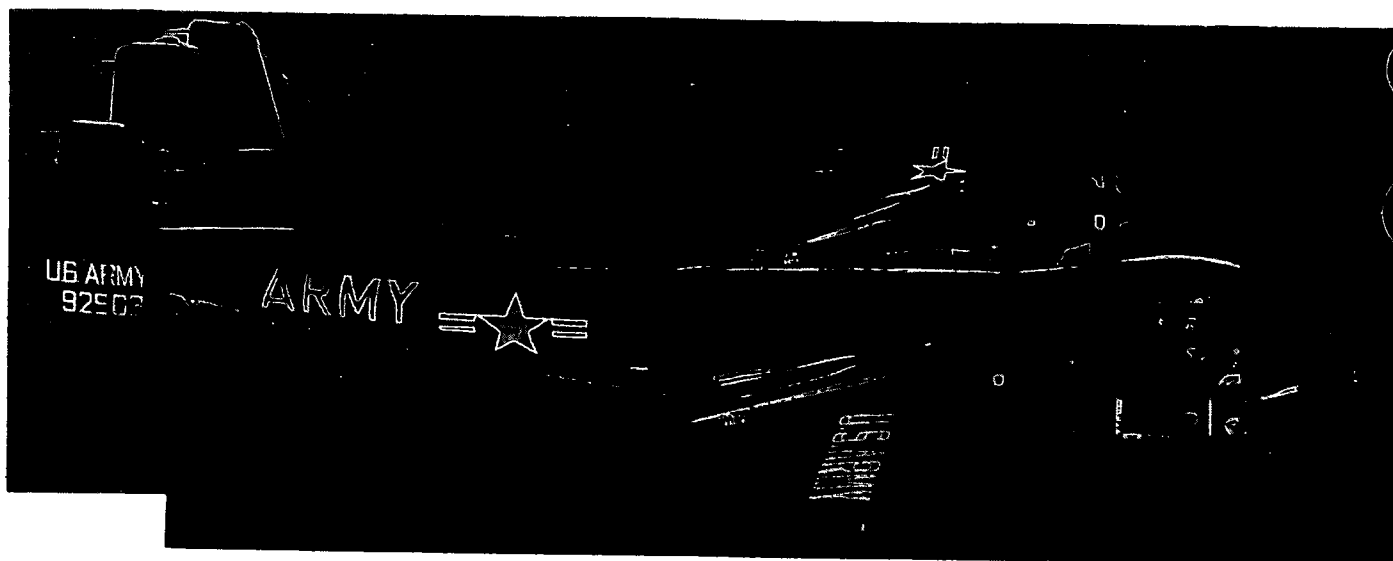


Figure 1-37. OV-1 (MOHAWK)

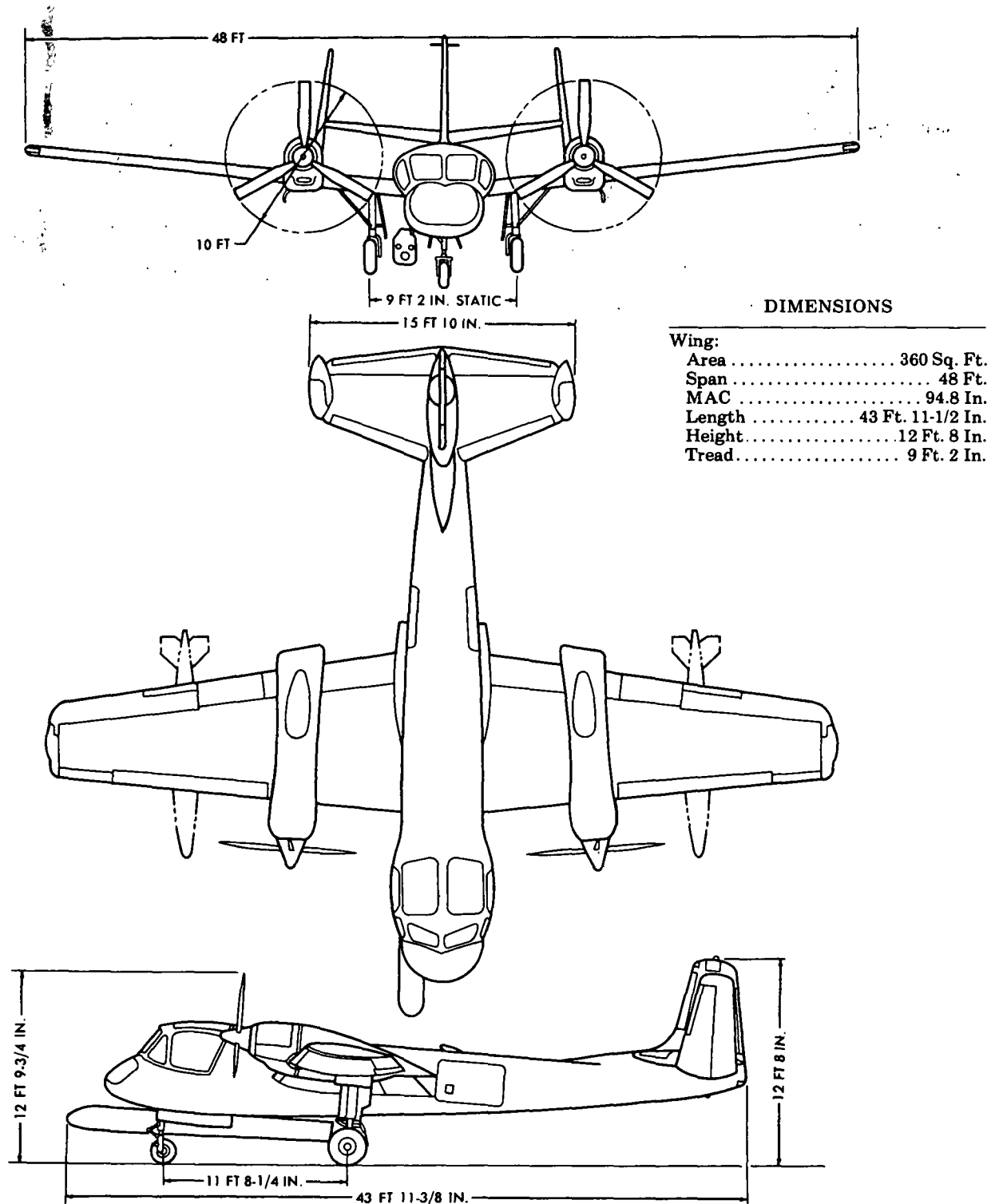


Figure 1-38. Principal Dimensions, OV-1B and C (Mohawk)

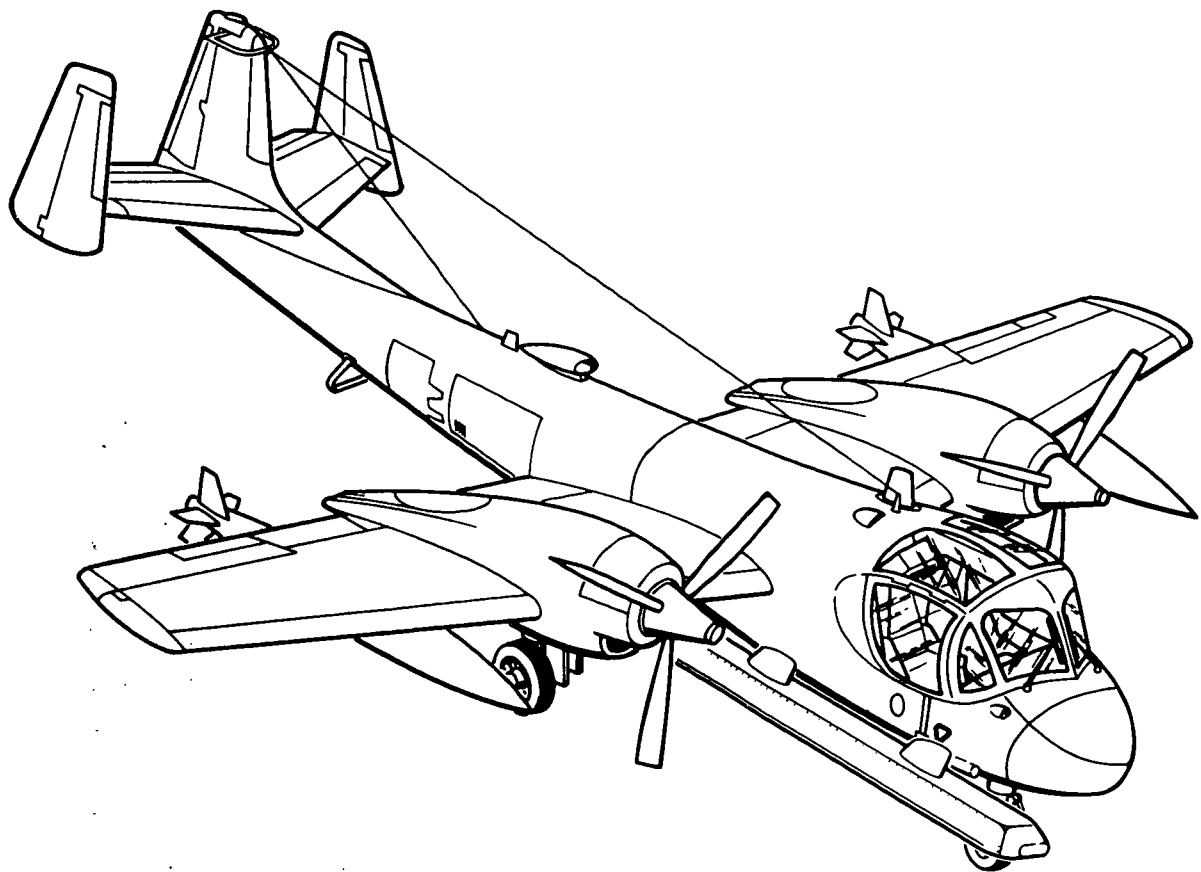


Figure 1-39. The OV-1B (Mohawk) aircraft

1-65. OV-1B (Mohawk) Characteristics.

ENGINE				MISSION AND DESCRIPTION		WEIGHTS	
No. & model (2) T53-L-7 Mfr Lycoming Type Free power turbine Engine spec No .. 104.21B & .11C Red. gear ratio ... 12.4 Prop mfr Ham std Blade design No . 7125-6 No. of blades ... 3 Prop dia 10 ft				Mfr's Model: Grumman The primary mission of the OV-1B is electronic surveillance using the sidelooking airborne radar (SLAR). In addition, it is capable of performing missions of photographic reconnaissance, visual reconnaissance and observation, artillery gunfire spotting, air control, and radiological monitoring. The OV-1B is a two-place, twin-turboprop aircraft capable of operating from small fields and unimproved runways. Design features include a midwing, three-tail configuration of semimonocoque construction equipped with wide span flaps. The crew of two are seated side-by-side within a bubbled enclosure at the extreme forward end of the fuselage. A remotely operated day-and-night KA-30 camera installation provides horizon-to-horizon photo coverage along the aircraft flight path. The OV-1B carries an APS-94 side looking airborne radar antenna as standard equipment. External provisions are incorporated to carry two 150-gallon fuel tanks or two resupply containers.		LB L.F. Empty E 10,983 Basic 11,217 Design 13,100 4.0 Combat (basic mission) 12,882 Normal takeoff . 13,654 Max takeoff ... 16,643 Max landing ... 16,643	
ENGINE RATINGS						FUEL AND OIL	
Output Rating/SL SHP SFC RPM Max (takeoff) 1100 0.670 1700 Mil 1000 0.679 1700 NRP 900 0.692 1700						Fuel: Grade JP-4 Spec MIL-T-5624 No. tanks: Fuselage (1) 297 gal External (2) 150 gal Total Qty ... 597 gal Oil: Spec MIL-L-23699 Qty 5 gal	
TECHNICAL PUBLICATION				DEVELOPMENT		AVIONICS / ARMAMENT	
AIRFRAME: TM55-1510-204-10/5 TM55-1510-204-CL/5 TM55-1510-204-20/1-1 & 20/1-2 TM55-1520-204-35-1 & 35-2 TM55-1510-204-23P1-P2-P3				First flight (prototype) November 1961 Estimated first service use January 1963		Refer to chapter 2.	
				FEATURES		FLYAWAY COSTS / NSN	
ENGINE: TM55-2840-233-24 TM55-2840-233-23P				Ejection Seats Low Physical Profile All Weather Operation Capability Capable of Deployment to Distant MSN Area by Using Extended Range Tanks (300 gal)		NSN 1510-00-715-9379 COSTS \$976,437 LIN A30221	
				Pilot..... 1 Mission Operator 1			

1-66. Loading and Performance - Typical Mission, OV-1B (Mohawk).

TAKEOFF LOADING CONDITION	OBSERVATION, NO STORES 1	NIGHT PHOTO, TWO A6 EJECTORS 3	EMERGENCY RESUPPLY, TWO RESUPPLY CONTAINERS 5	FERRY, TWO 150-GAL EXT TANKS 7
TAKEOFF WEIGHT (lb) ...	13,654	13,915	15,168	15,918
Fuel internal/external (lb) ...	1930	1930	1930	1930/1950
Payload (lb) ...	.....	264	1500	.....
Wing loading (lb/sq ft) ...	38	38.7	42.1	44.6
Stall speed (power-off) ^{4/} (kn) ...	73	73.8	77	79
Takeoff run at SL - calm (ft) ...	995	1040	1270	1410
Takeoff to clear 50 ft - calm (ft) ...	1625	1690	2000	2185
Max speed/altitude ^{1/} (kn/ft) ...	240.5/12,500	238/12,000	226.8/10,000	226/8000
Rate of climb at SL ^{2/} (fpm) ...	2800	2700	2320	2160
Time: SL to 20,000 ft ^{2/} (min) ...	9.5	10	13	15
Time: SL to 25,000 ft ^{2/} (min) ...	15.5	16	23	26.5
Service ceiling (100 fpm) ^{2/} (ft) ...	29,500	28,750	26,500	24,900
COMBAT RANGE ^{3/} (nmi) ...	365	358	334	1053
Average cruising speed (kn) ...	200	200	200	203
Cruising altitude (s) (ft) ...	5000	5000	5000	20,000
Cruise time (hr) ...	1.80	1.77	1.64	4.98
Mission time (hr) ...	1.84	1.80	1.69	5.30
COMBAT LOADING CONDITION	NO STORES 2	TWO A6 EJECTORS 4	TWO RESUPPLY CONTAINERS 6	
COMBAT WEIGHT (60 percent internal fuel) . (lb) ...	12,882	13,143	14,396	.....
Engine power Military	Military	Military	Military	.....
Fuel (lb) ...	1158	1158	1158	.....
Combat speed/combat altitude ^{2/} (kn/ft) ...	250/5000	248/5000	238/5000	.....
Rate of climb/combat altitude ^{2/} (fpm/ft) ...	2660/5000	2560/5000	2175/5000	.....
Combat ceiling (500 fpm) ^{2/} (ft) ...	27,700	26,900	23,800	.....
Rate of climb at SL ^{2/} (fpm) ...	3050	2940	2530	.....
Max speed at SL ^{2/} (kn) ...	247.2	244.9	235.9	.....
Max speed/altitude ^{2/} (kn/ft) ...	252/11,500	249.5/11,500	239.5/10,000	.....
LANDING WEIGHT (10 percent internal fuel) (lb) ...	11,917	12,178	13,431	.....
Fuel (lb) ...	193	193	193	.....
Stall speed-power-off/approach power ^{5/} ... (kn) ...	67.5/54.6	68.2/55.2	71.5/58	.....
Landing distance clear 50-ft obstacle ... (ft) ...	870	890	1330	.....

1-66. Loading and Performance — Typical Mission, OV-1B (Mohawk) (CONT).

- 1/ Normal rated power.
- 2/ Military rated power.
- 3/ See notes on mission specifications.
- 4/ Flight idle power, propeller control at max rpm.
- 5/ Power for level flight at 120 percent of stall speed, power off, propeller control at max rpm.

Source: DRCPM-AEL(2)

1-67. OV-1C (Mohawk) Characteristics.

ENGINE				MISSION AND DESCRIPTION		WEIGHTS	
No. & model (2) T53-L-7/15 Mfr Lycoming Type Power free turbine Engine spec No. 104.11C, .21-B and .35 Red. gear ratio 12.46 Prop mfr Ham std No. blades 3 Blade design No. 7125-6 Prop dia 10 ft				Mfr's Model: Grumman The primary mission of the OV-1C is to perform Infrared (IR) reconnaissance missions using the Infrared sensor. In addition it is capable of performing photographic missions, visual reconnaissance and observation, artillery gunfire spotting, air control, and radiological monitoring. The OV-1C is a two-place, twin-turboprop aircraft capable of operating from small fields and unimproved runways. Design features include a midwing, three-tail configuration of semi-monocoque construction equipped with wide span flaps. The crew of two are seated side-by side within a bubbled enclosure at the extreme forward end of the fuselage. A remotely operated day-and night KA-30 or KA-76 camera installation provides horizon-to-horizon photo coverage along the aircraft flight path. A nose-mounted KA-60, 70-mm panoramic camera is also provided. The OV-1C carries AN/ASS14 infrared detection equipment. The infrared surveillance system makes it possible to detect military terrestrial targets by inherent characteristics that are distinguishable in the visual and infrared portion of the electromagnetic spectrum. External provisions are incorporated to carry two 150-gallon fuel tanks or two resupply containers.		LB L.F. Empty 10,011 Basic 10,379 Design 11,924 4.9/4.0 Combat (basic mission) 12,296 Normal takeoff . 12,682 Max takeoff ... 15,302 Max landing ... 15,302	
ENGINE RATINGS						FUEL AND OIL	
T53-L-7						Fuel: Grade JP-4 Spec MIL-T-5624 No. tanks: Fuselage (1) 297 gal External (2) 150 gal Total qty 597 gal Oil: Spec MIL-L-23699 Qty 5 gal	
Rating/SL SHP SFC Output RPM Max (takeoff) 1100 0.670 1700 Mil 1000 0.679 1700 NRP 900 0.692 1700							
T53-L-15							
Rating/SL SHP SFC Output RPM Mil 1160* 0.620 1700 NRP 1000* 0.650 1600							
*Mechanical limited.				DEVELOPMENT		AVIONICS / ARMAMENT	
TECHNICAL PUBLICATION				First flight (prototype) March 1961 First service use July 1961		Refer to chapter 2.	
				FEATURES		PERSONNEL	
AIRFRAME: TM55-1510-204-10/4 TM55-1510-204-CL/4 TM55-1510-204-20/1 & 20/1-2 TM55-1510-204-35-1 & 35-2 TM55-1510-204-23P1-P2-P3				Ejection Seats Low Physical Profile All Weather Operation Capability Capable of Deployment to Distant MSN Area by Using Extended Range Tanks (300 gal)		Pilot..... 1 Mission Operator 1	
ENGINE: TM55-2840-233-24 TM55-2840-233-23P						NSN 1510-00715-9380 LIN A30271 COSTS \$1,058,540	

1-68. Loading and Performance — Typical Mission, OV-1C (Mohawk).

TAKEOFF LOADING CONDITION	OBSERVATION NO STORES 1	NIGHT PHOTO, TWO A6 EJECTORS 3	EMERGENCY RESUPPLY TWO RESUPPLY CONTAINERS 5	FERRY, TWO 150-GAL EXT TANKS 7
TAKEOFF WEIGHT (lb) ...	12,682	12,943	14,197	14,961
Fuel (lb) ...	1930	1930	1930	3880
Payload (lb) ...	...	264	1500	...
Wing loading (lb/sq ft) ...	38.4	39.2	43.0	45.3
Stall speed (power-off) ^{4/} (kn) ...	74	74	78	80
Takeoff run at SL — calm ^{6/} (ft) ...	990	1040	1270	1440
Takeoff run at SL — 25-kn wind ^{6/} (ft) ...	613	640	802	930
Takeoff to clear 50 ft - calm ^{6/} (ft) ...	1640	1680	2000	2230
Max speed/altitude ^{1/} (kn/ft) ...	246/10,000	243/10,000	229/5000	230/SL
Rate of climb at SL ^{1/} (fpm) ...	2270	2175	1800	1630
Time: SL to 20,000 ft ^{1/} , ^{2/} (min) ...	14/12	15/13	22/17	27/22
Time: SL to 25,000 ft ^{1/} , ^{2/} (min) ...	24/20	27/22	47/35	64/47
Service ceiling (100 fpm) ^{1/} , ^{2/} (ft) ...	26,200/27,450	25,700/26,500	21,600/23,200	20,200/21,300
COMBAT RANGE ^{3/} (nmi) ...	408	397	362	1081
Average cruising speed (kn) ...	200	200	200	215
Cruising altitude(s) (ft) ...	5000	5000	5000	20,000
Cruise time (hr) ...	2.01	1.96	1.78	4.72
Mission time (hr) ...	2.05	2.00	1.83	5.17
COMBAT LOADING CONDITION	NO STORES 2	TWO A6 EJECTORS 4	TWO RESUPPLY CONTAINERS 6	
COMBAT WEIGHT (60 percent internal fuel) (lb) ...	11,910	12,171	13,425	...
Engine power Military	Military	Military	Military	...
Fuel (lb) ...	1158	1158	1158	...
Combat speed/combat altitude ^{2/} (kn/ft) ...	256/5000	252/5000	240/5000	...
Rate of climb/combat altitude ^{2/} (fpm/ft) ...	2100/5000	2000/5000	1620/5000	...
Combat ceiling (500 fpm) ^{2/} (ft) ...	25,200	24,300	20,400	...
Rate of climb at SL ^{2/} (fpm) ...	2880	2780	2320	...
Max speed at SL ^{2/} (kn) ...	255	252	239	...
Max speed/altitude ^{2/} (kn/ft) ...	256/10,000	253/10,000	240/5000	...
LANDING WEIGHT (10 percent internal fuel) (lb) ...	10,945	11,206	12,460	...
Fuel (lb) ...	193	193	193	...
Stall speed-power off ^{4/} /approach power ^{5/} (kn) ...	68/54	69/55	72/58	...
Landing distance to clear 50-ft obstacle (ft) ...	850 ^{7/}	870 ^{7/}	1335 ^{8/}	...

1-68. Loading and Performance — Typical Mission, OV-1C (Mohawk) (CONT).

¹/Normal rated power.

²/Military rated power.

³/See notes on mission specifications.

⁴/Flight idle power, propeller control at max rpm.

⁵/Power for level flight at 120 percent of stall speed, power off, propeller control at max rpm.

⁶/Takeoff distances are based on takeoff and obstacle speed equal to 120 percent of power-off stall speed in takeoff configuration.

⁷/Landing distance is based on approach speed equal to 110 percent of landing stall speed with rate of sink equal to 14 fps.

⁸/Landing distance is based on approach speed equal to 110 percent of landing stall speed, power off, with rate of sink equal to 8 fps.

1-69. Performance Notes, OV-1B and C (Mohawk).

**TACTICAL AIR OBSERVATION MISSION
AND NIGHT PHOTOGRAPHY (Columns 1, 3,
and 5, paragraph 1-74).**

Warm up, taxi, take off, climb on course to 5000 feet at normal rated power, and cruise at 200 knots at 5000 feet until all but reserve fuel is consumed. Range-free allowances are 5 minutes at normal rated power for warmup, taxi, and take off, plus 10 percent of initial internal fuel for reserve.

FERRY MISSION (Column 7, paragraph 1-74).

Warm up, taxi, take off, climb on course to altitude for maximum range at normal rated power, cruise at altitude and velocity for maximum range until all but reserve fuel is consumed, and drop external fuel tanks when empty. Range-free allowances are 5 minutes at normal rated power for warmup, taxi, and take off, plus 10 percent of initial fuel for reserve.

Source: DRCPM-AEL

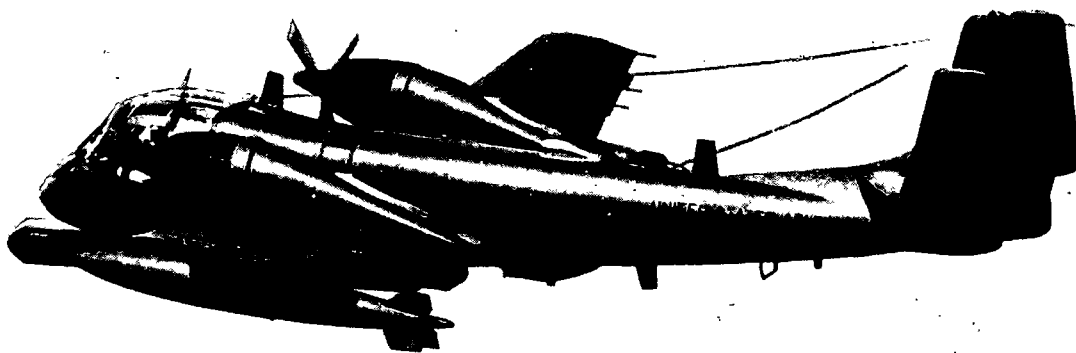
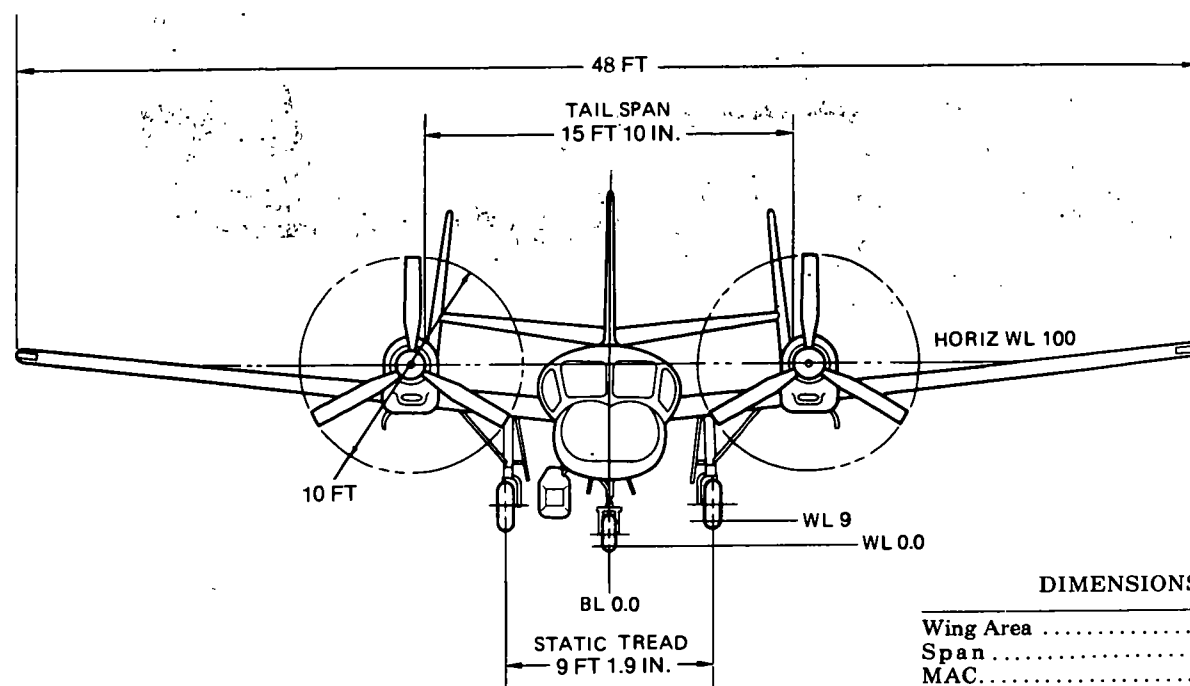


Figure 1-40. OV-1D (Mohawk)



DIMENSIONS

Wing Area	360 Sq. Ft.
Span	48 Ft.
MAC	98 Ft.
Length	41 Ft.
	3.65 In.
Height	12 Ft. 8 In.
Tread	9 Ft. 2 In.

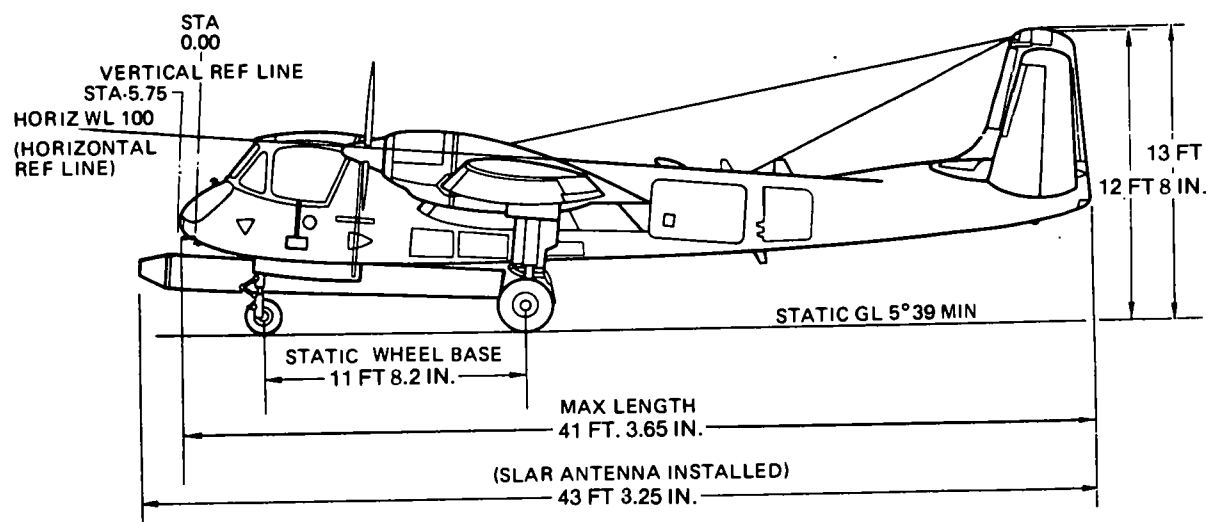


Figure 1-41. Principal Dimensions, OV-1D (Mohawk)

1-70. OV-1D (Mohawk) Characteristics.

ENGINE				MISSION AND DESCRIPTION		WEIGHTS	
No. & model (2) T53-L-701				The primary mission of the OV-1D is to perform either infrared (IR) reconnaissance or side looking airborne radar (SLAR) missions. The SLAR and IR are interchangeable. In addition, it is capable of performing photographic missions, visual reconnaissance and observation, artillery gunfire spotting, air control, and radiological monitoring. The OV-1D is a two-place, twin turboprop aircraft capable of operating from small fields and unimproved runways. Design features include a midwing, three-tail configuration of semimonocoque construction equipped with wide span flaps. The crew of two are seated side-by-side within a bubbled enclosure at the extreme forward end of the fuselage. The OV-1D is equipped with three independent photographic systems, all of which have automatic exposure controls and can be operated by either the pilot or observer. External provisions are incorporated to carry two 150-gallon fuel tanks, two ECM pods, or LS 59A photo flasher.		Refer to Loading and Performance Chart. (Par 1-71)	
Mfr Lycoming							
Type Free power Turbine							
Engine spec No 104.39							
Red. gear ratio 12.38							
Prop mfr Ham std				FUEL & OIL			
Blade design No 5157C-6							
No of blades 3							
Prop dia 10 ft							
ENGINE RATINGS						Fuel	
T53L-701 Output						Grade JP-4/5	
Rating/SL	SHP	SFC	RPM			Spec MIL-T-5624	
MIL	1400	.590	1650			No. tanks	
NRP				Fuselage (1) 297 gal		External (2) 150 gal	
				Total qty 597 gal		Oil:	
				Spec MIL-L-23699		Qty 5 gallon	
TECHNICAL PUBLICATIONS						AVIONICS/ARMAMENT	
AIRFRAME:						Refer to Chapter 2.	
TM55-1510-213-10						FLYAWAY COSTS/NSN	
TM55-1510-213-CL							
TM55-1510-213-23-1-2-3				NSN 1510-00869-3654			
TM-55-1510-204-23P1-P2-P3				LIN A30296 COSTS			
TM55-1510-213-PMS				\$2,033,066			
ENGINE:							
TM-55-2840-233-24							
TM-55-2840-233-23P							

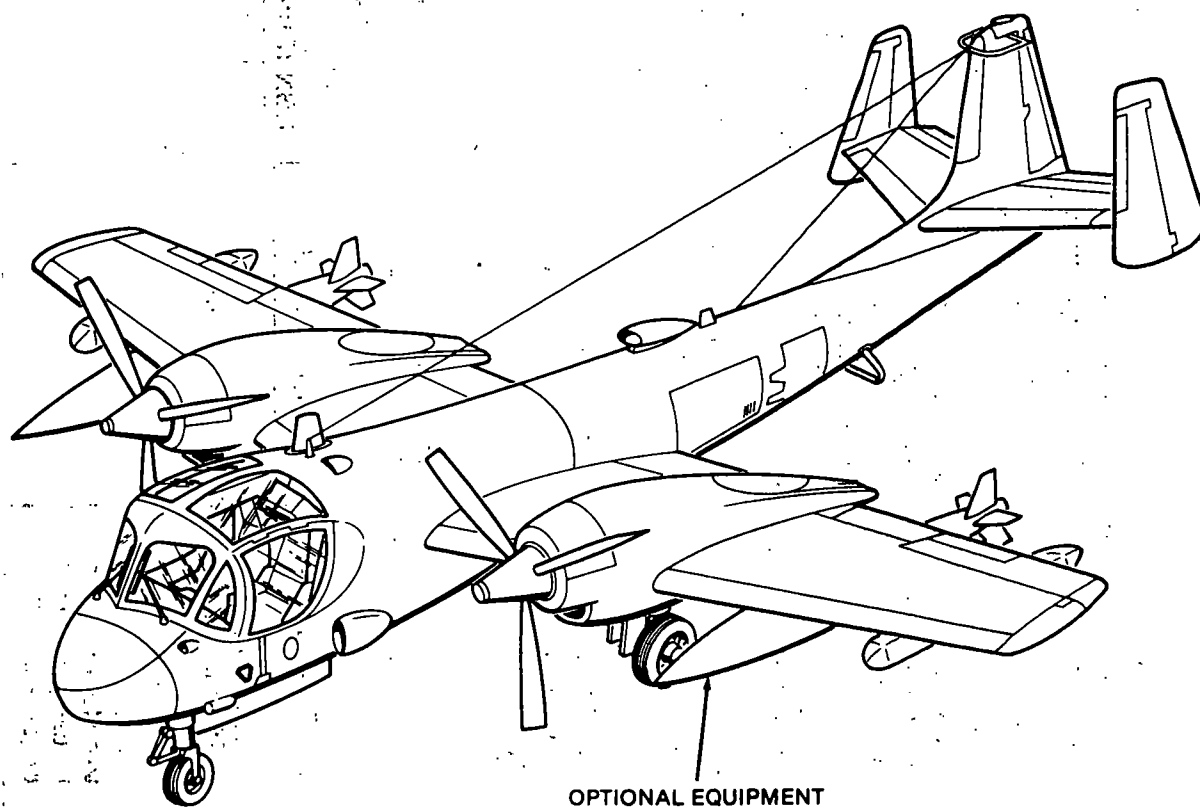


Figure 1-42. RV-1D Aircraft

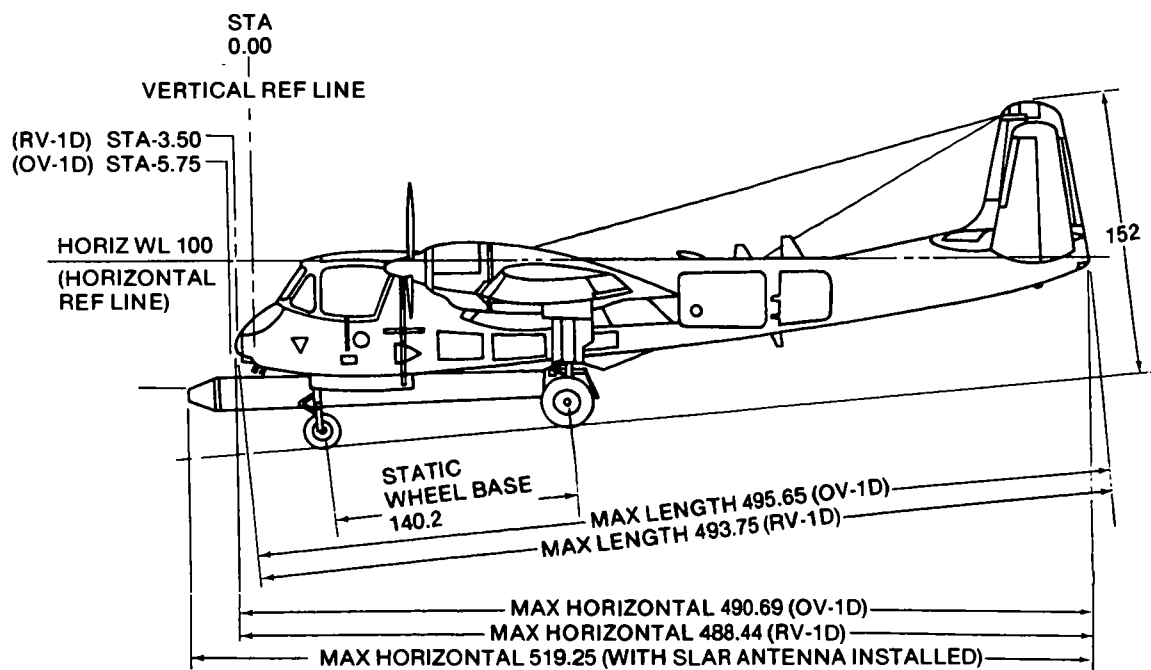
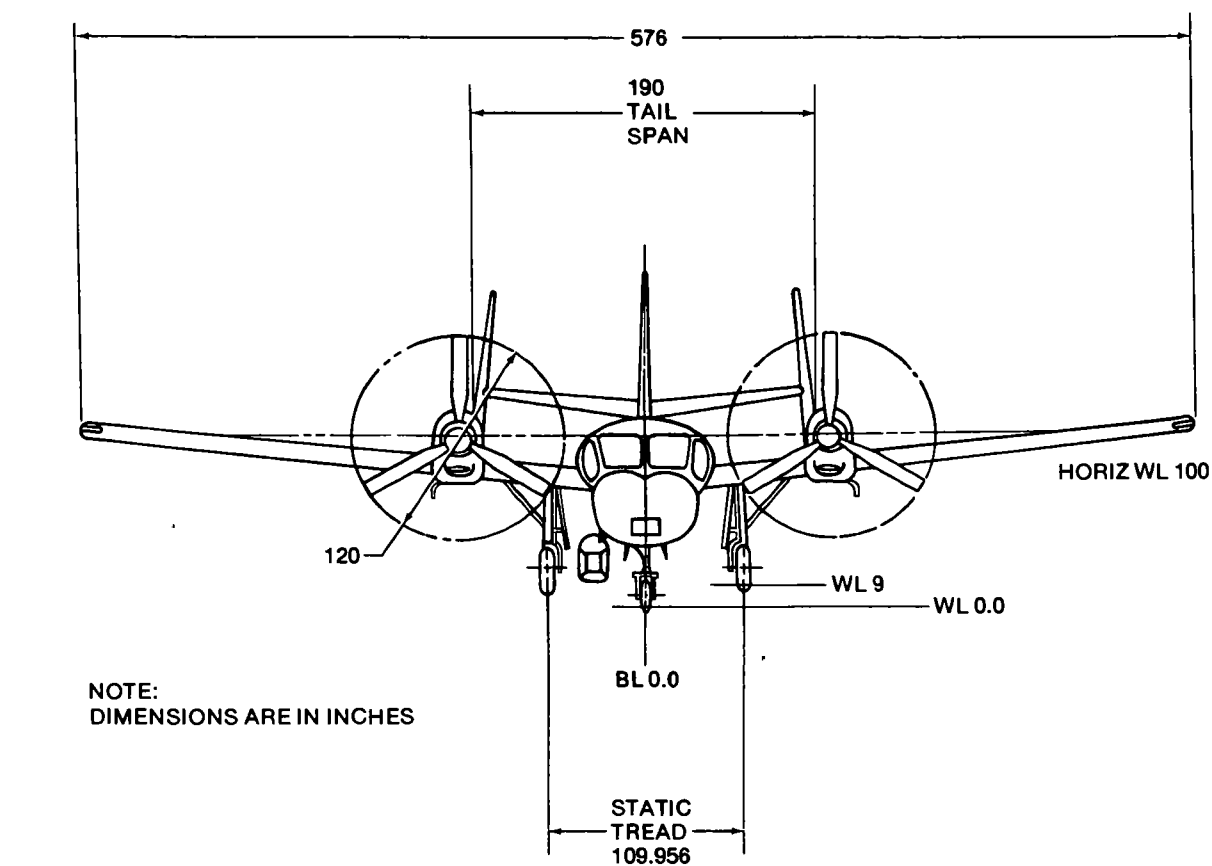


Figure 1-43. Aircraft Dimensions

1-71. RV-1D (Quick Look)

ENGINE				MISSION AND DESCRIPTION		WEIGHTS	
No. & model..... (2) T53-L-701				The Quick Look II system provides an electronic location and identification capability operation in a tactical environment. The RV-1D is a two-place, twin turboprop aircraft capable of operating from small fields and unimproved runways. Design features include a mid-wing, three-tail configuration of semimonocoque construction. Large area flaps and droop ailerons are installed for added lift/drag requirements.		Refer to Loading and Performance Chart. (Par 1-71)	
Mfr Lycoming							
Type Free power Turbine							
Engine spec No..... 104.39							
Red. gear ratio..... 12.38							
Prop mfr..... Ham std							
Blade design No..... 5157C-6				FUEL & OIL		Fuel	
No. of blades 3						Grade..... JP-4/5	
Prop dia..... 10ft						Spec..... MIL-T-5624	
						No. tanks	
				DEVELOPMENT		Fuselage..... (1) 297 gal	
				Date of contract Jul 75		External..... (2) 150 gal	
				Contracting agency Grumman & UTL		Total qty 597 gal	
				No. of test aircraft 2		Oil:	
				First flight scheduled Mar 77		Spec MIL-L-23699	
				Completion of test & eval DT/OT III..... 15 Nov 77		Qty 5 gallon	
				Follow on tests..... 30 Apr 78			
				Contract delivery schedule Jul 77			
ENGINE RATINGS						AVIONICS/ARMAMENT	
T53L-701 Output						Refer to Chapter 2.	
Rating/SL SHP SFC RPM							
MIL 1400 .590 1650							
NRP 1250 .610 1590						FLYAWAY COSTS/NSN	
TECHNICAL PUBLICATIONS				FEATURES		PERSONNEL	
AIRFRAME:				Ejection Seat's		Pilot..... 1	
TM55-1510-213-10				Low Physical Profile		Mission Operator 1	
TM55-1510-213-CL				All weather operation			
TM55-1510-213-23-1-2-3				capability			
TM55-1510-204-23P1-P2-P3				Capable of deployment			
TM55-1510-213-DMS				to distant msn area			
ENGINE:				by using extended			
TM 55-2840-233-24				range tanks (300 gal)			
TM 55-2840-233-23P						NSN 1510-00368-8440	
						LIN A30 444 COSTS	
						\$2,886,664	

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1-72. Loading & Performance - Typical Mission RV-1D (Mohawk)

TAKEOFF LOADING CONDITION		MAX GROSS WT. WITH AN/ALQ 133 AND AN/USQ 61 NO EXT FUEL TANKS	MAX GROSS WT. WITH AN/ALQ 133 AND AN/USQ 61 EXT FUEL TANKS
Take Off Weight	(lb)	15,532	17,482
Weight Empty	(lb)	11,905	11,905
Payload (useful) ^{9/}	(lb)	3,027	5,577
Fuel (Internal)	(lb)	1,930	3,880
Stall Speed (Power Off) ^{4/}	(kn)	80	94
Take Off Run at SL-Calm ^{6/} 15°C	(ft)	1,300	2,400
Take Off Run at SL-25 Kn Head Wind ^{6/} 15°C	(ft)	975	1,800
Take Off to Clear 50ft - Calm ^{6/} 15°C	(ft)	1,900	2,400
Max Speed/Altitude	(kn/ft)	215/5000	214/500
Rate of Climb at SL ^{1/}	(fpm)	2,500	2,200
Timp: SL to 20,000 ft ^{1/2/}	(min)	13/10	16/12
Time: SL to 25,000 ft ^{1/2/}	(min)	22/17	29/22
Service Ceiling (100 fpm) ^{1/2/}	(ft)	25,000	25,000
Combat Range ^{3/}	(nm)	355—	710
Average Cruising Speed	(kn)	180	180
Cruise Altitude (5)	(ft)	5,000	5,000
Cruise Time ^{3/}	(hr)	1.9	38
COMBAT LOADING CONDITION			
Combat Weight (60% Internal Fuel)	(lb)	14,760	16,710
Engine Power (Prop RPM, Eng Torque Press)	(rpm/lb)	1720/122	1720/122
Fuel	(lb)	1158	3108
Rate of Climb/Combat Altitude	(fpm/ft)	1800/5000	1500/5000
Combat Ceiling (500 fpm)	(ft)	25,000	25,000
Landing Weight (10% Internal Fuel)	(lb)	13,795	13,795
Fuel	(lb)	193	193
Stall Speed-Power-Off ^{4/} Approach Power ^{5/}	(kias/kn)	78/70	78/70
Landing Distance to Clear 50ft Obstacle	(ft)	2,000	2,000

1-72. Loading and Performance - Typical Mission, OV-1D (Mohawk) (CONT).

- 1/** Normal rated power.
- 2/** Military rated power.
- 3/** See Mission Type. Sample is based on:
 - a. 5000 ft altitude.
 - b. Standard day.
 - c. 180 knots CAS.
 - d. All stores installed.
 - e. Full external fuel, if installed.
 - f. Total fuel consumption, with 10% reserve remaining.
 - g. A total mission distance, from point of origin and return.
- 4/** Flight idle power, 0° -Bank, 15° flaps KIAS
- 5/** Power for level flight at 120 per cent of stall speed, power-off, 15° flaps KT.
- 6/** Takeoff distances are based on takeoff and obstacle speed equal to 120 per cent of power-off stall speed in takeoff configuration.
- 7/** Landing distance based on a ground and air distance total at sea level approach speed equal to 120 per cent of landing stall speed or a CAS of 90.5 knots, ambient temp or 20°C, 0 knot head wind and 12.2 FPS rate of sink.
- 8/** Landing distance based on a ground and air distance total, at sea level approach speed equal to 120 per cent of landing stall speed or a CAS of 98 knots, ambient temp of 20°C, 0 knot head wind and 12.2 FPS rate of sink.
- 9/** Fuel and mission essential equipment.

Source: DRCPM-AEL (2)

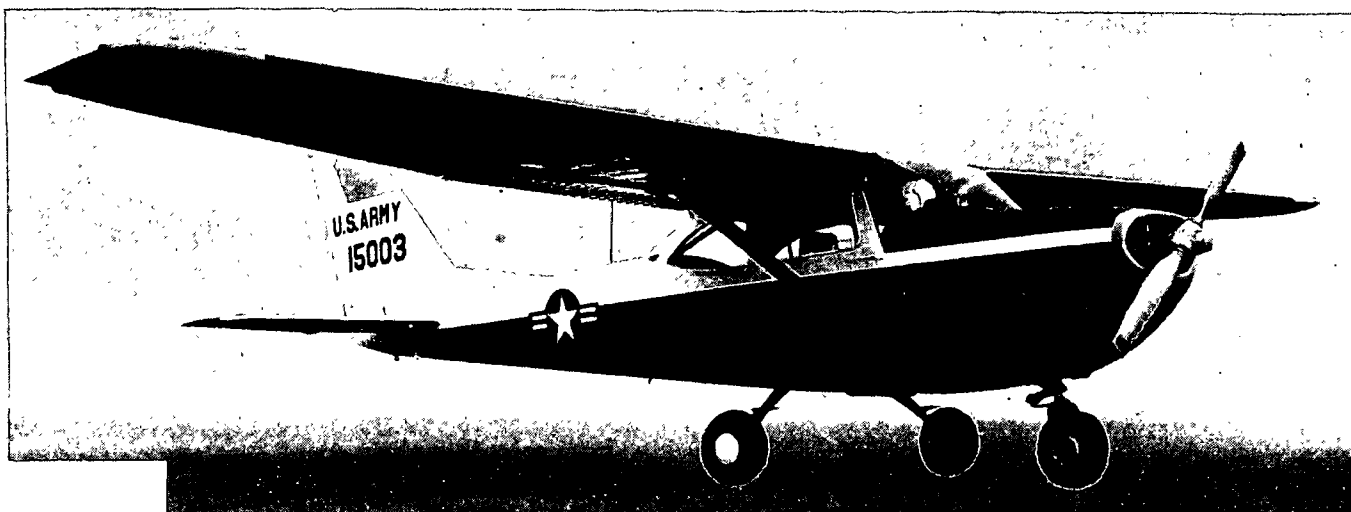


Figure 1-44. T-41B (Mescalero)

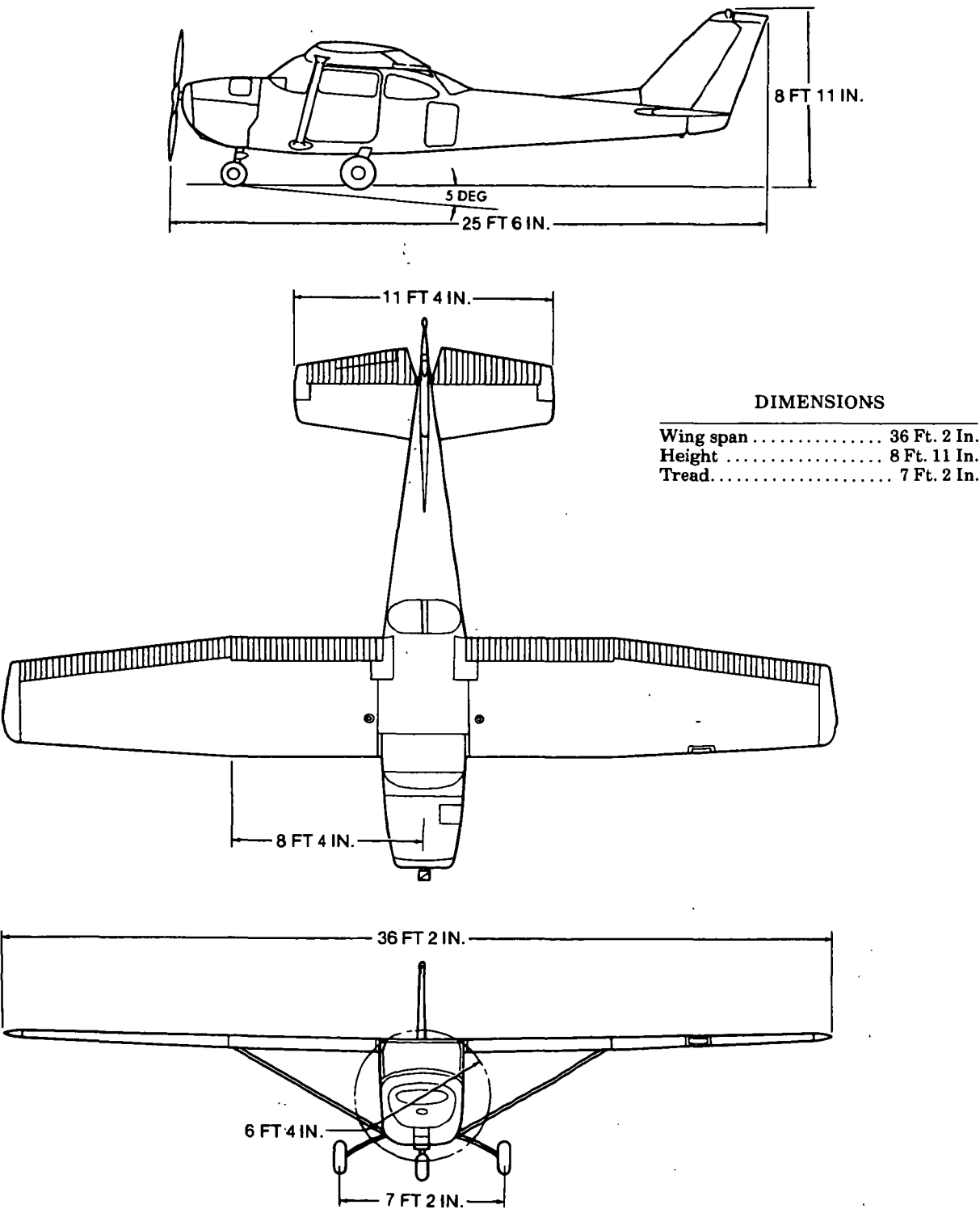


Figure 1-45. Principal Dimensions, T-41B (Mescalero)

1-73. T-41B (Mescalero) Characteristics.

ENGINE			MISSION AND DESCRIPTION		WEIGHTS	
No. & model (1) IO-360D Mfr..... Continental Prop type..... CS, VP Prop dia 6 ft, 4 in.			Mfr's Model: Cessna 172 The T-41B is an interim inventory fill to replace O-1 drawdown pending availability of the OH-6A. Missions include primary and advanced contact trainer and installation support roles. The T-41B will be used in two configurations as follows: Utility mission – FAA normal category to include aircraft empty weight, including electronics, crew of two (instructor and student), at 200 pounds each, and fuel for endurance for 4.5 hours at 110 knots. Normal mission – FAA normal category to include aircraft empty weight, including electronics, crew of one, two passengers, at 200 pounds each, and fuel for endurance for 4.5 hours at 110 knots.		LB Empty 1545 Utility 2200 Normal..... 2500	
ENGINE RATING					FUEL AND OIL	
	BHP	RPM			Fuel:	
Takeoff	210	2800			Grade 115/145	
Normal	210	2800			Spec MIL-G-5572	
TECHNICAL PUBLICATIONS AIRFRAME: TM 55-1510-212-10 Commercial Manuals (Contractor Supported) ENGINE: Commercial Manual			DEVELOPMENT		Qty 52 gal	
			Date of contract 8 August 1966 First Production acft October 1966		Oil:	
					Spec	
					Temps above	
					+40°F MHS-24A	
					(SAE 50)	
					Temps below	
					+40°F MHS-24A	
					(SAE 30)	
					AVIONICS/ARMAMENT	
		Refer to chapter 2.				
		FLYAWAY COSTS/NSN				
		NSN 1510-00929-1012				
		LIN A30052 COSTS				
		\$16,200				

1-74. Performance — Typical Mission, T-41B (Mescalero)

Range (4.5 hours)..... (mi)...	590
Cruise speed ^{1/} (mph):...	148
Max speed (mph)...	153
Takeoff distance (ft)...	635
Landing distance (ft)...	400
Rate of climb (fpm)...	910
Service ceiling (ft)...	17,500

^{1/}75 percent power at 5500 feet.

Source: DRSTS-WP

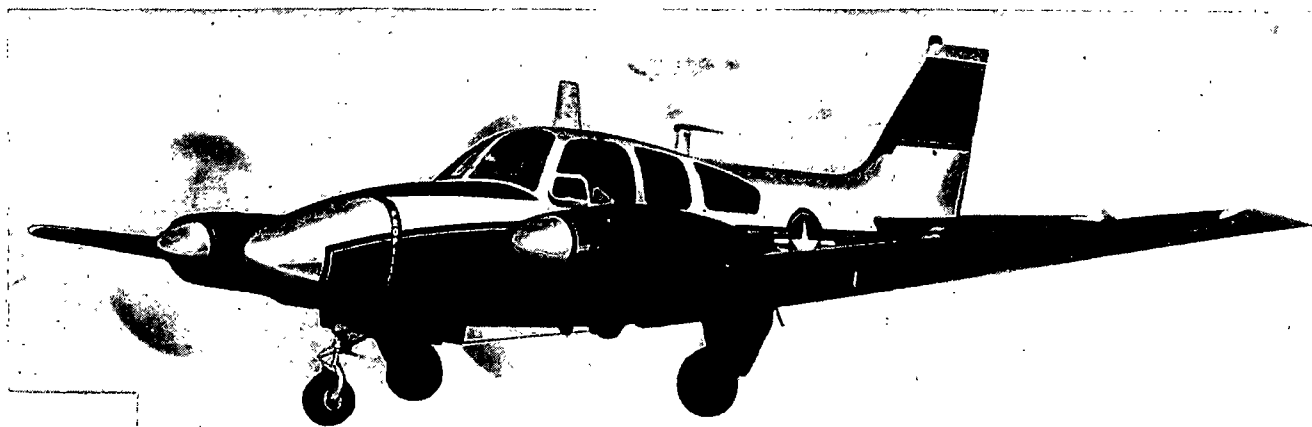
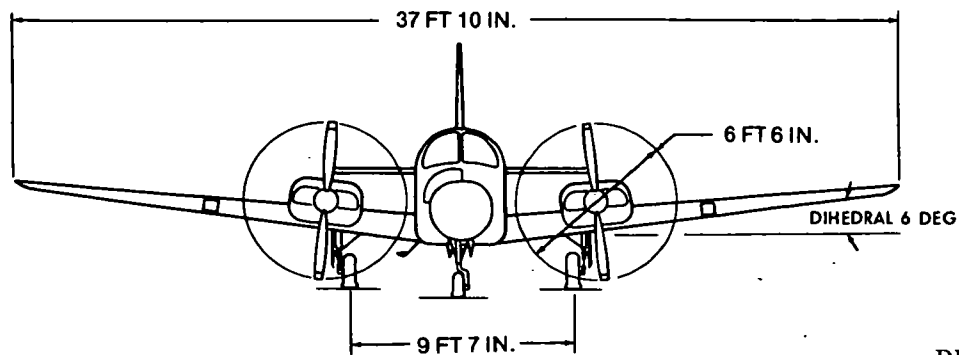


Figure 1-46. T-42A (Cochise)



DIMENSIONS

Wing:	
Span	37 Ft. 10 In.
Incidence (root)	4°
(tip)	-1°
Dihedral	6°
Sweepback	0.0°
Length	27 Ft. 3 In.
Height	9 Ft. 7 In.
Tread	9 Ft. 7 In.
Prop and clearance	10-1/2 In.

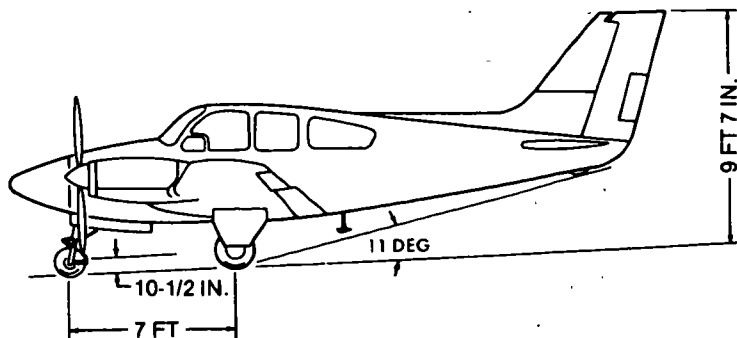
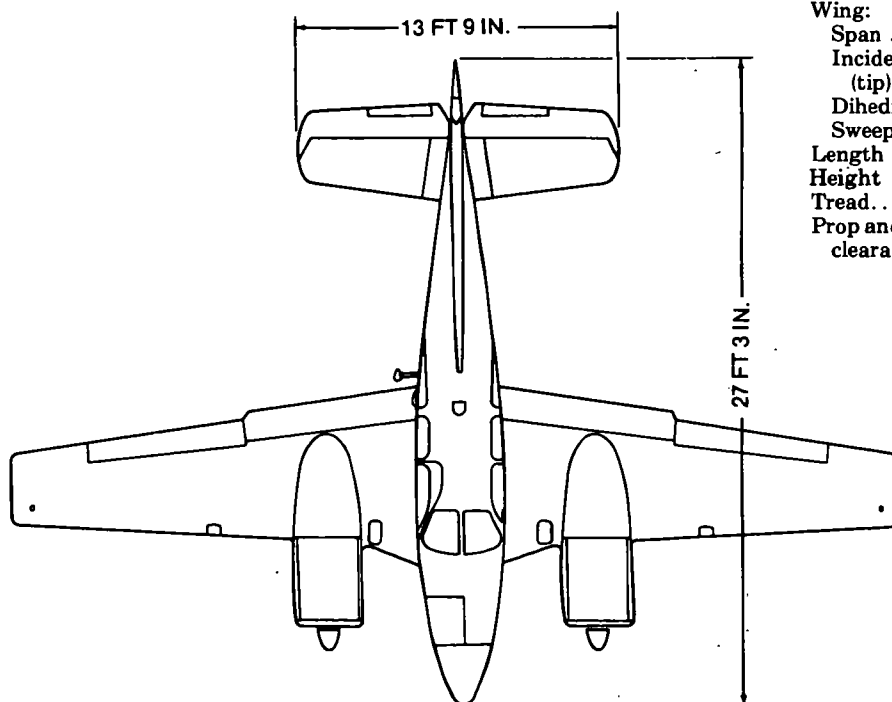


Figure 1-47. Principal Dimensions, T-42A (Cochise)

ENGINE	MISSION AND DESCRIPTION	WEIGHTS
No. & model (2) IO-470-L Mfr Continental Engine spec No . . 1634-B Prop mfr McCauley Blade design No . . 78FF-0 Prop type Hyd, CS, FF Prop dia 6 ft, 6 in. No. blades 2	Mfr's Model: Beech 95-B55B The primary mission of the T-42A is the training of military pilots in instrument flying, in both day and night Instrument Flight Rule operations. The secondary mission of the T-42A is twin-engine transition training of single engine rated pilots. The T-42A is an all-metal, twin-engine, four place low wing monoplane, with retractable landing gear. The cabin is designed to accommodate an instructor pilot and three student pilots. The instructor and primary student sit side by side; the two additional students sit immediately behind. The instructor and primary student each have a complete set of flight controls and instruments. The seating arrangement permits inflight movements of students from the forward primary seat to the rear seats. Emergency evacuation is accomplished by quick-release jettison of windows on both sides of the windshield. The warm air system is utilized for anti-icing, defrosting, and defogging of windshield.	LB L.F. Empty 3423 Basic 3480 Design 5100 +4.4, -3.0 Max takeoff 5100 do Max 5100 do
ENGINE RATINGS		FUEL AND OIL
BHP RPM ALT MIN Takeoff 260 2625 SL Cont. Normal 260 2625 SL Cont.		Fuel: Grade 115/145 Spec MIL-G-5572 No. tanks 4 Location Wing Qty 136 gal Oil: Spec Temps above +40°F MHS-24A (SAE 50) Temps below +40°F MHS-24A (SAE 30) Location Engines Qty 6 gal
TECHNICAL PUBLICATIONS	DEVELOPMENT	
AIRFRAME: TM 55-1510-212-10 Commercial Manuals (Contractor Supported)	Date of contract February 1965 First flight July 1965 First acceptance August 1965 Production completed June 1966	
ENGINE: Commercial Manual	FEATURES Cabin air conditioning, heating, and ventilation. Cabin soundproofing. Oxygen system. Dual controls and instruments. Steerable nose wheel. Fuel injection. Propeller anti-icing and wing and stabilizer deicing. Rotating beacon. Three-axis trim.	PERSONNEL Crew 4 Instructor pilot 1 Student pilot 3 or Crew 1 Passengers 3
		AVIONICS/ARMAMENT Refer to chapter 2.
		FLYAWAY COSTS/NSN NSN 1510-00872-7908 LIN A 30596 Costs, \$102,907

1-76. Loading and Performance - Typical Mission, T-42A (Cochise).

TAKEOFF LOADING CONDITIONS		BASIC MISSION
Takeoff weight	(lb)	5,100
Fuel	(lb)	816
Payload	(lb)	—
Wing loading	(lbs/sq ft)	25.5
Stall speed ^{1/}	(kn)	68
Stall speed ^{2/}	(kn)	76.5
Takeoff run at SL	(ft)	910
Takeoff run to clear 50 ft	(ft)	1,255
Max speed SL	(kn)	205
Rate climb SL	(fpm)	1,670
Time SL to 10,000 ft	(min)	8
Service ceiling (100 FPM)	(ft)	19,700
LANDING WEIGHT		
(10% Fuel)		4,333
Fuel	(lb)	85
Ground roll at SL	(ft)	805
Landing distance to clear 50 ft obstacle	(ft)	1,580

^{1/} Zero thrust, flaps 28°, and gear down^{2/} Power OFF, flaps up, and gear up

Source: DRSTS-WP

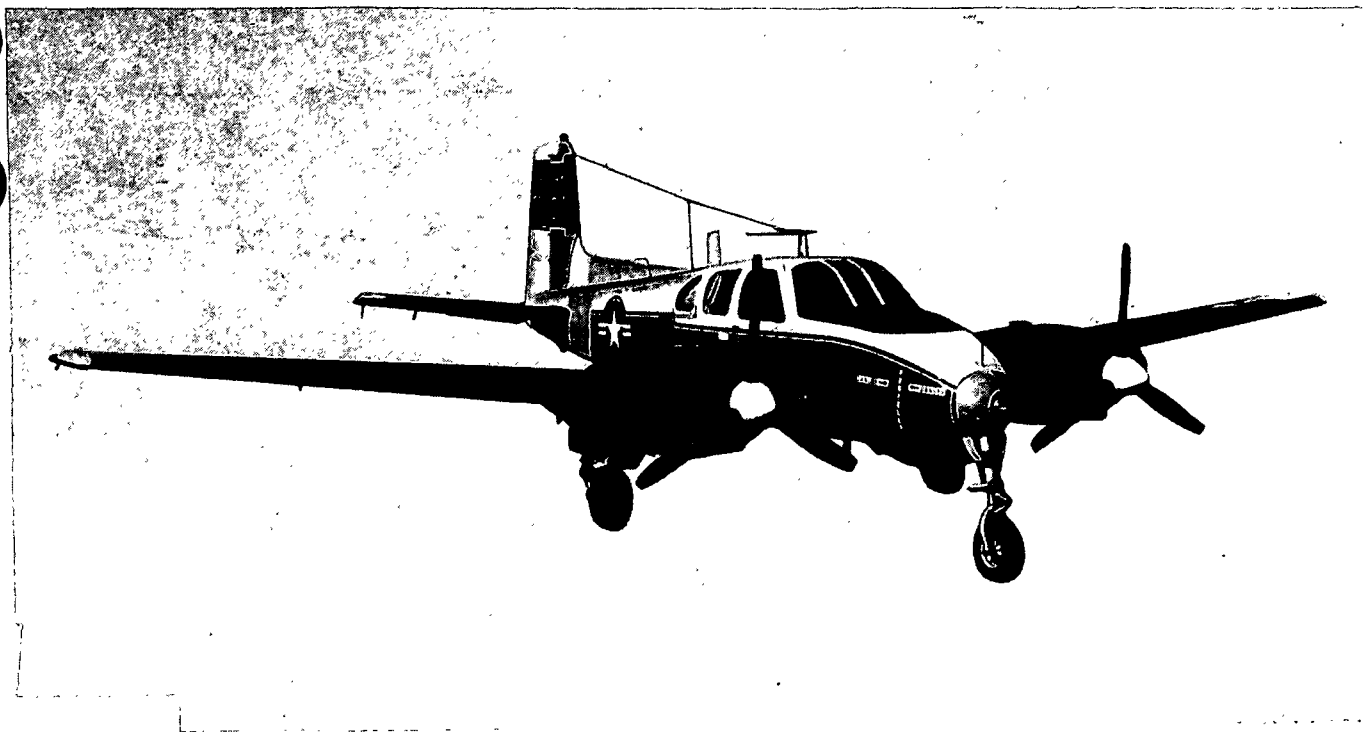


Figure 1-48. U-8D and G (Seminole), typical, (minor differences apparent between D and G models)

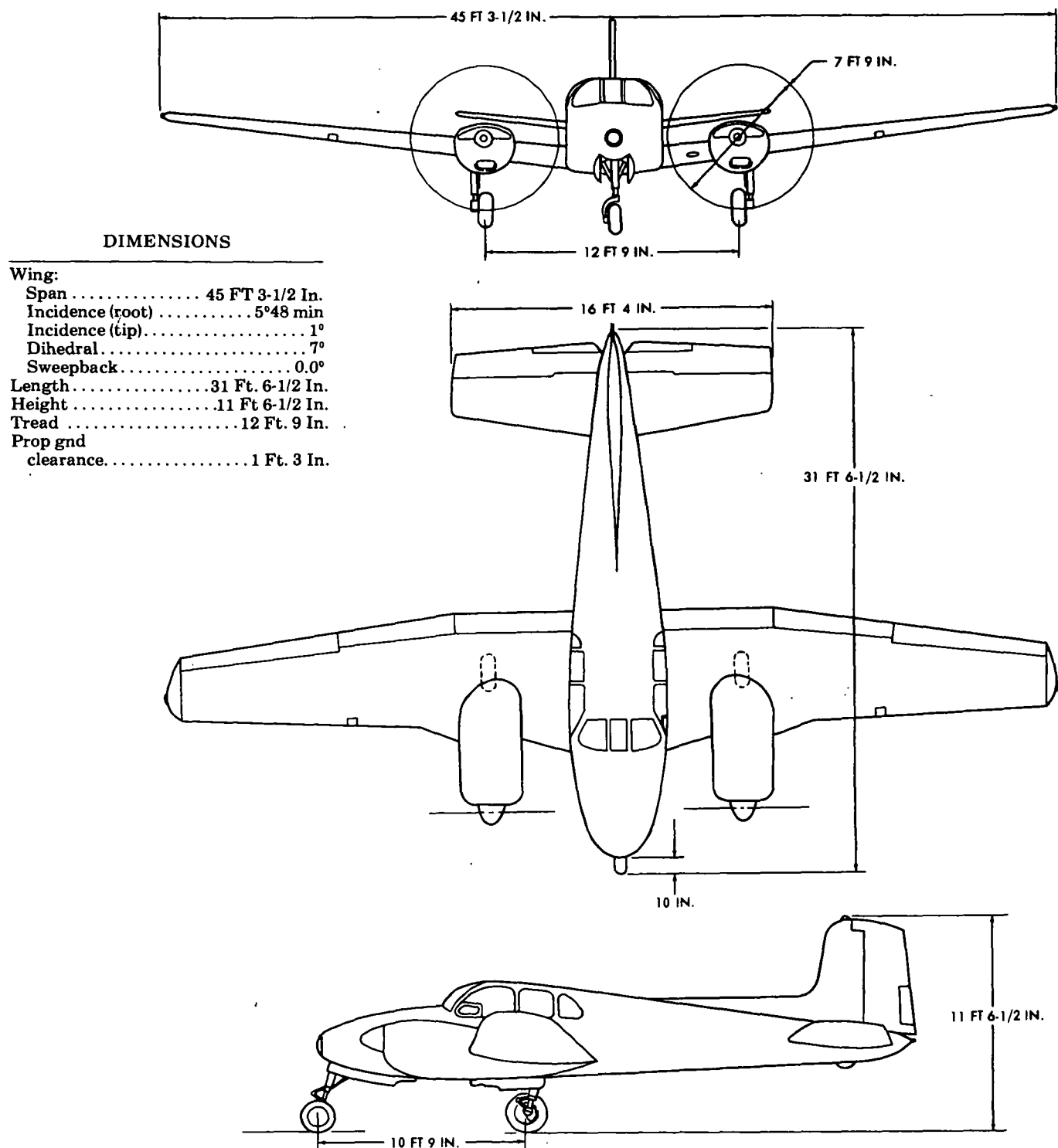


Figure 1-49. Principal Dimensions, U-8D/G (Seminole)

1-77. U-8D/G* (Seminole) Characteristics.

1-77. U-8D/G* (Seminole) Characteristics.

1-78. Loading and Performance - Typical Mission, U-8D/G (Seminole).

CONDITIONS	BASIC MISSION	DESIGN MISSION	NORMAL MISSION	FERRY RANGE
TAKEOFF WEIGHT (lb) ...	7300 ^{4/}	7300 ^{4/}	7300 ^{4/}	6618 ^{4/}
Fuel at 6.0 lb/gal (grade 115/145) (lb) ...	1380	1062	1380	1380
Payload (outbound) (lb) ...	682	1000	682	None
Payload (inbound) (lb) ...	None	None	None	....
Wing loading (psf) ...	26.4	26.4	26.4	23.9
Stall speed (power off) (land config) (kn) ...	75.0	75.0	75.0	71.5
Takeoff ground run at SL ^{1/} (ft) ...	1430	1430	1430	1095
Takeoff to clear 50 ft ^{1/} (ft) ...	2385	2385	2385	1900
Rate of climb at SL ^{2/} (fpm) ...	1480	1480	1480	1780
Rate of climb at SL (one engine out) ^{2/} (fpm) ...	155	155	155	285
Time: SL to 10,000 ft ^{2/} (min) ...	7.8	7.8	7.8	6.5
Time: SL to 20,000 ft ^{2/} (min) ...	21.6	21.6	21.6	17.2
Service ceiling (100 fpm) ^{2/} (ft) ...	25,500	25,500	25,500	27,000
Service ceiling (one engine out) ^{2/} (ft) ...	9500	9500	9500	10,000
COMBAT RANGE (nmi) ...	1121	882	912	1185
Average cruising speed (kn) ...	140	140	171	139
Cruising altitude (ft) ...	10,000	10,000	10,000	10,000
Total mission time (hr) ...	8.08	6.43	5.45	8.55
COMBAT RADIUS ^{3/} (nmi) ...	528	387	430 ^{5/}	....
Average cruising speed (kn) ...	140	140	172	....
Cruising altitude (ft) ...	10,000	10,000	10,000	....
Total mission time (hr) ...	7.62	5.67	5.10	....
FIRST LANDING WEIGHT ^{3/} (lb) ...	6630	6768	6630	....
Ground roll at SL (ft) ...	1240	1266	1240	....
Total from 50 ft (ft) ...	2018	2063	2018	....
COMBAT WEIGHT ^{3/} (lb) ...	5948	5768	5948	5347
Combat altitude (ft) ...	10,000	10,000	10,000	10,000
Combat speed ^{2/} (kn) ...	199	199	199	200
Combat climb ^{2/} (fpm) ...	1550	1620	1550	1765
Combat ceiling (500 fpm) ^{2/} (ft) ...	24,100	25,000	24,100	26,500
Service ceiling (100 fpm) ^{2/} (ft) ...	29,700	30,500	29,700	31,700
Service ceiling (one engine out) ^{2/} (ft) ...	10,900	11,100	10,900	11,600
Takeoff ground run at SL ^{1/} (ft) ...	830	750	830	....
Takeoff to clear 50 ft ^{1/} (ft) ...	1485	1350	1485	....
Rate of climb at SL ^{2/} (fpm) ...	2010	2090	2010	2250

1-78. Loading and Performance - Typical Mission, U-8D/G (Seminole) (CONT).

CONDITIONS	BASIC MISSION	DESIGN MISSION	NORMAL MISSION	FERRY RANGE
Max speed at 9000 ft ^{2/} (kn)...	200	200	200	200
Basic speed at 5000 ft ^{2/} (kn)...	192	192	192	193
LANDING WEIGHT..... (lb)...	5342	5445	5342	5347
Ground roll at SL..... (ft)...	1000	1015	1000	1000
Total from 50 ft..... (ft)...	1630	1640	1630	1630

^{1/} Max power.

^{2/} METO power.

^{3/} For RADIUS mission if radius is shown.

^{4/} Includes crew of 1 at 200 lb.

^{5/} 65-percent METO power used for cruise.

Performance Basis:

Phase IV flight test.

1-79. Performance Notes, U-8D/G (Seminole).**FORMULA: RADIUS MISSIONS I & II**

Warm up, take off, climb on course to 10,000 feet at METO power, cruise out at long range speeds to remote base, land, and discharge passengers and baggage. Without refueling, warm up, take off, climb on course to 10,000 feet at METO power, and return at long range speeds. Range-free allowances are 10 minutes of METO power for warmups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, climb on course to 10,000 feet at METO power, cruise out at 65 percent power to remote base, land, and discharge passengers and baggage. Without refueling, warm up, take off, climb on course to 10,000 feet at METO power, and return at 65 percent power. Range-free allowances are 10 minutes of METO power for warmups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSIONS I, II, & IV

Warm up, take off, climb on course to 10,000 feet at METO power, and cruise out at long range speeds until only reserve fuel remains. Range-free allowances are 5 minutes of METO power for warmup and takeoff, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Warm up, take off, climb on course to 10,000 feet at METO power, and cruise out at 65 percent power until only reserve fuel remains. Range-free allowances are 5 minutes of METO power for warmup and takeoff, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

GENERAL DATA

Engine ratings shown are engine manufacturer's guaranteed ratings. Power values used in performance calculations for the O-480-1 engine are as follows:

	BHP	RPM	ALT	MIN
Max	340	3400	SL	5
METO	320	3200	SL	Cont.

PERFORMANCE REFERENCE

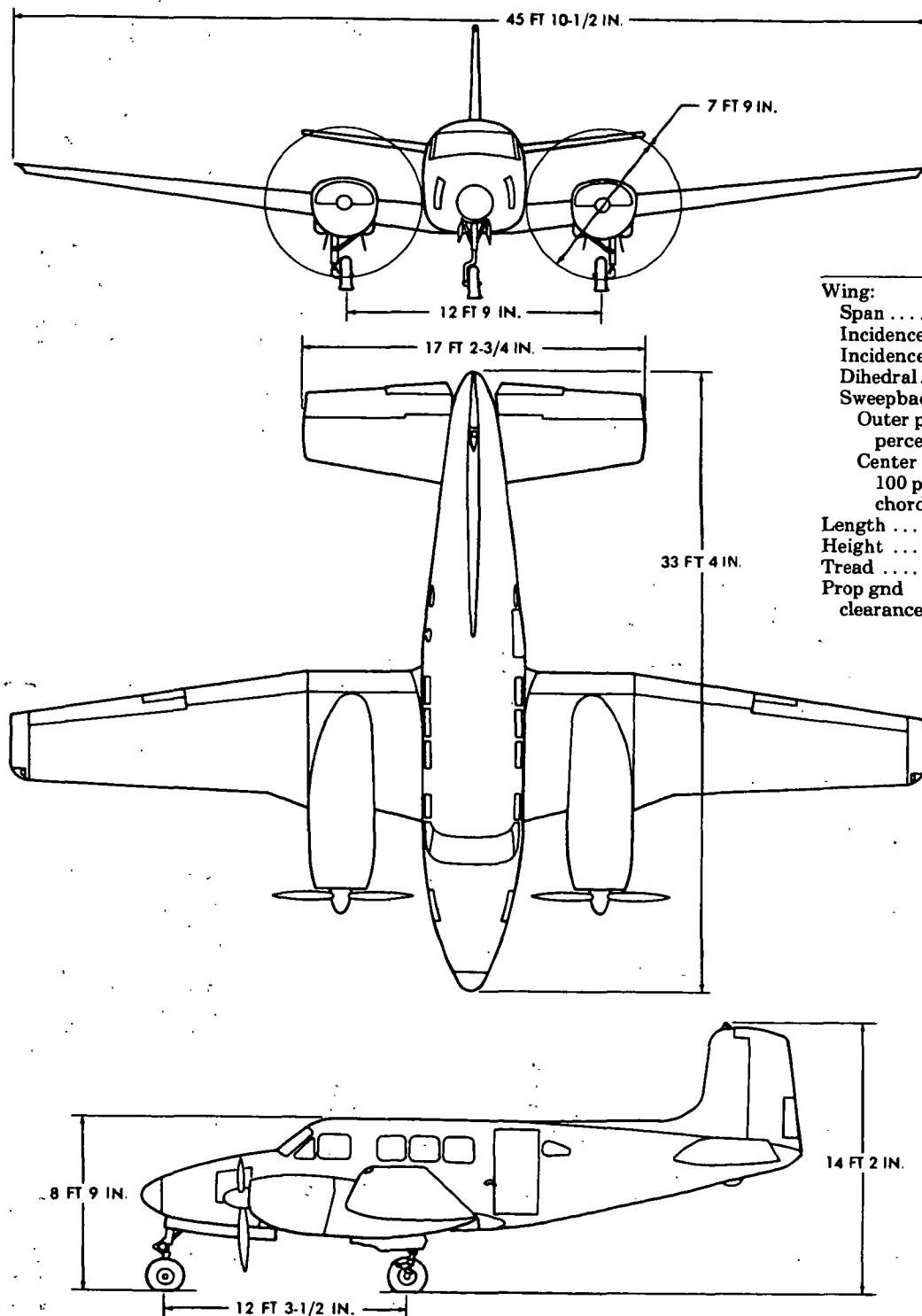
Beech Aerodynamic Report 691, Performance Data for the USAF Standard Aircraft Characteristics Charts from Phase IV Flight Test of the L-23D Airplane.

Beech Aerodynamic Report 725, U.S. Army Flight Manual Substantiating Data from USAF Phase IV Flight Tests (U-8D).

Source: DRSTS-WP



Figure 1-50. U-8F (Seminole)



DIMENSIONS

Wing:	
Span	45 Ft. 10-1/2 In.
Incidence (root)	4°, 48 min
Incidence (tip)	0.0°
Dihedral	7°
Sweepback:	
Outer panel 25 percent chord	0.0°
Center section 100 percent chord	0.0°
Length	33 Ft. 4 In.
Height	14 Ft. 2 In.
Tread	12 Ft. 9 In.
Prop gnd clearance	10-1/2 In.

Figure 1- 51. Principal Dimensions, U-8F (Seminole)

1-80. U-8F(Seminole) Characteristics

ENGINE						MISSION AND DESCRIPTION		WEIGHTS	
No. & model (2) O-480-3A Mfr Lycoming Engine spec No .. 2228 Superch 1 stg, centrif Red. gear ratio ... 77:120 Prop mfr Hartzell Blade design No .. 10151-B8 Prop type Hyd, FF, CS No. blades 3 Prop dia 7 ft, 9 in. Augmentation ... Fuel injection (3-piston type)						Mfg. Model: Beech The principal mission of the U-8F is the transportation of personnel. The U-8F is a semimonocoque, low-wing monoplane easily converted into a cargo carrier by removing the passenger compartment seats. The U-8F is similar to the U-8D except the larger fuselage is arranged with separate crew and passenger compartments. The crew compartment is arranged with the pilot's seat on the left and the copilot's seat on the right of a center aisle. It is equipped with dual flight controls and is separated from the passenger compartment with sliding doors. The passenger compartment is arranged with two passenger seats on the left and two or three passenger seats on the right of the center aisle. The track-mounted seats facilitate removal or installation and permit versatile seating arrangements. The baggage compartment is located at the rear of the passenger compartment with access from the passenger compartment. The cabin access door on the left side of the fuselage, aft of the wing, incorporates stair-type steps and may be opened or closed and locked from either the inside or outside. A jettisonable escape hatch is located opposite the cabin access door. Powerplants feature fuel injection and manually selected, electrically actuated inlet air source selection.		LB L.F. Empty (calculated) 5246 Basic (calculated) . . 5282 Design 7700 +6.6 -2.64 Combat (basic mission) 6276 Max takeoff: (overload) *7700 (normal) *7700 Max landing **7350 +6.6 -2.64 *Limited by strength. **Limited by gear strength.	
ENGINE RATINGS								FUEL AND OIL	
	BHP	RPM	ALT	MIN				Fuel:	
Takeoff	320	3400	SL	5				Grade 115/145	
	340	3400	11,000	5				Spec MIL-G-5572	
Normal	320	3200	SL	Cont.				No. tanks 8	
	320	3200	11,000	Cont.				Location Wing	
								Qty 230 gal	
TECHNICAL PUBLICATIONS						DEVELOPMENT		Oil:	
AIRFRAME:						First flight August 1958		Spec	
TM-55-1510-201-10/3 (D/F)						First delivery February 1959		Temps above	
TM-55-1510-201-10/4 (D/G)						Production completed December 1962		+60°F MIL-L-22851	
TM-55-1510-201-10/5 (F)						FEATURES		Type II	
TM-55-1510-201-20 (D/G/F)						Thermostatically controlled cabin heat.		Temps below	
TM-55-1510-201-20P (D/G/F)						Fresh air and oxygen outlets at each station.		+60°F MIL-L-22851	
TM-55-1510-201-34P1 (D/G/F)						Electrically actuated flaps.		Type III	
TM-55-1510-201-34P2 (D/G/F)						Conventional flight controls, manually operated.		No. tanks 2	
TM-55-1510-201-35 (D/G/F)						Steerable nose wheel.		Qty 8 gal	
TM-55-1510-201-CL/4 (D/G)						Full feathering props.		AVIONICS/ARMAMENT	
TM-55-1510-201-CL/5 (F)						Hydraulically controlled brakes.		Refer to chapter 2.	
TM-55-1510-201-ESC (D/G/F)						Crossfeed fuel system.		FLYAWAY COSTS/NSN	
TM-55-1510-201-PMS (D/F/G)						Windshield wipers.		NSN 1510-00701-2233	
						Deicing and anti-ice equipment.		LIN A30821 COSTS,	
ENGINE:								\$144,593	
TM55-2810-218-10									
TM55-2810-218-34									
TM55-2810-218-34P									

1-81. Loading and Performance - Typical Mission, U-8F (Seminole).

CONDITIONS	BASIC MISSION	DESIGN MISSION	NORMAL MISSION	FERRY RANGE
TAKEOFF WEIGHT	7700 ^{4/}	7700 ^{4/}	7700 ^{4/}	6922 ^{4/}
Fuel at 6.0 lb/gal (grade 115/145)	1380	1158	1380	1380
Payload (outbound)	778	1000	778	None
Payload (inbound)	None	None	None	....
Wing loading	27.5	27.5	27.5	24.7
Stall speed (power off)	72	72	72	68
Takeoff ground run at SL ^{1/}	1320	1320	1320	1000
Takeoff to clear 50 ft ^{1/}	2200	2200	2200	1720
Rate of climb at SL ^{2/}	1304	1304	1304	1550
Rate of climb at SL (one engine out)	184	184	184	310
Time: SL to 10,000 ft ^{2/}	8.1	8.1	8.1	6.8
Time: SL to 20,000 ft ^{2/}	19.1	19.1	19.1	15.7
Service ceiling (100 fpm) ^{2/}	27,000	27,100	27,100	30,000
Service ceiling (one engine out) ^{2/}	7800	7800	7800	13,500
COMBAT RANGE	1104	898	883 ^{5/}	1220
Average cruising speed	134	135	171	127
Cruising altitude	10,000	10,000	10,000	10,000
Total mission time	8.38	6.67	5.23	9.61
COMBAT RADIUS ^{3/}	539	434	415 ^{5/}	....
Average cruising speed	130	130	172	....
Cruising altitude	10,000	10,000	10,000	....
Total mission time	8.35	6.83	4.97	....
FIRST LANDING WEIGHT ^{3/}	7054	7119	7044	....
Ground roll at SL	1280	1310	1285	....
Total from 50 ft	2025	2075	2030	....
COMBAT WEIGHT ^{3/}	6276	6138	6266	5650
Combat altitude	10,000	10,000	10,000	10,000
Combat speed ^{2/}	203	203	203	204
Combat climb ^{2/}	1685	1735	1670	1935
Combat ceiling (500 fpm) ^{2/}	27,200	27,700	27,100	29,800
Service ceiling (100 fpm) ^{2/}	32,500	32,900	32,400	34,600
Service ceiling (one engine out) ^{2/}	15,550	15,900	15,450	17,500
Takeoff ground run at SL ^{1/}	760	720	760	600
Takeoff to clear 50 ft ^{1/}	1355	1300	1360	1060
Max rate of climb at SL ^{2/}	1825	1870	1820	2100
Max speed at 12,000 ft ^{2/}	207	207	207	208
Basic speed at 5000 ft ^{2/}	193	193	193	194
LANDING WEIGHT	5643	5632	5643	5643
Ground roll at SL	1065	1060	1065	1065
Total from 50 ft	1665	1660	1665	1665

^{1/}Maximum power - 3400 rpm.^{2/}Normal power - 3200 rpm.

1-81. Loading Performance - Typical Mission, U-8F (Seminole) (CONT).

3/For RADIUS mission if radius is shown.

4/Includes crew of 1 at 200 lb.

5/65-percent normal power used for cruise.

Performance Basis:

- a. Data source: Contractor's flight test.
- b. Performance is based on powers shown.

1-82 . Performance Notes, U-8F (Seminole).

FORMULA: RADIUS MISSIONS I & II

Warm up, take off, climb on course to 10,000 feet at normal power, cruise out at long range speeds to remote base, land, and discharge passengers and baggage. Without refueling, warm up, take off, climb on course to 10,000 feet at normal power, and return at long range speeds. Range-free allowances are 10 minutes of normal power for warmups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, climb on course to 10,000 feet at normal power, cruise out at 65-percent power to remote base, land, and discharge passengers and baggage. Without refueling, warm up, take off, climb on course to 10,000 feet at normal power, and return at 65-percent power. Range-free allowances are 10 minutes of normal power for warmups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSIONS I, II, & IV

Warm up, take off, climb on course to 10,000 feet at normal power, and cruise out at long range speeds until all but reserve fuel is consumed. Range-free allowances are 5 minutes of normal power for warmup and takeoff, plus fuel for 20 minutes at speeds for

long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Warm up, take off, climb on course to 10,000 feet at normal power, and cruise out at 65-percent power until all but reserve fuel is consumed. Range-free allowances are 5 minutes of normal power for warmup and takeoff, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

PERFORMANCE REFERENCE

Beech Aerodynamic Report 677, Jackson, P.A., Type Inspection Report No. 50-20, Model 65 (L-23F), Gross Weight 7368 lb.

Beech Aerodynamic Report 678 and Appendixes A, B, C, and D, Hughes, A.C., Preliminary Flight-Test Evaluation L-23F Prototype.

Beech Aerodynamic Report 679, Jackson, P.A., Flight-Test Performance, Model 65 (L-23F), 7368 lb.

Beech Aerodynamic Report 695, Jackson, P.A., Type Inspection Report 65-2, Model 65 (L-23F), 7700 lb.

Beech Aerodynamic Report 732, Ross, H.C., U.S. Army Flight Manual Substantiating Data from Beech Flight Tests (L-23F).

Source: DRSTS-WP

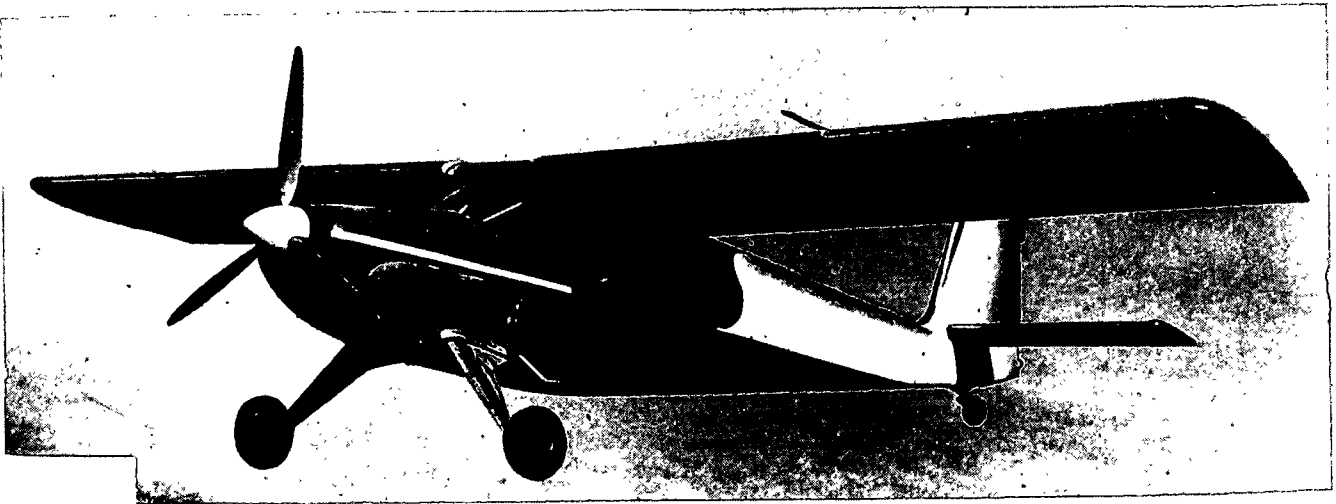


Figure 1-52. U-10A (Helio-Courier)

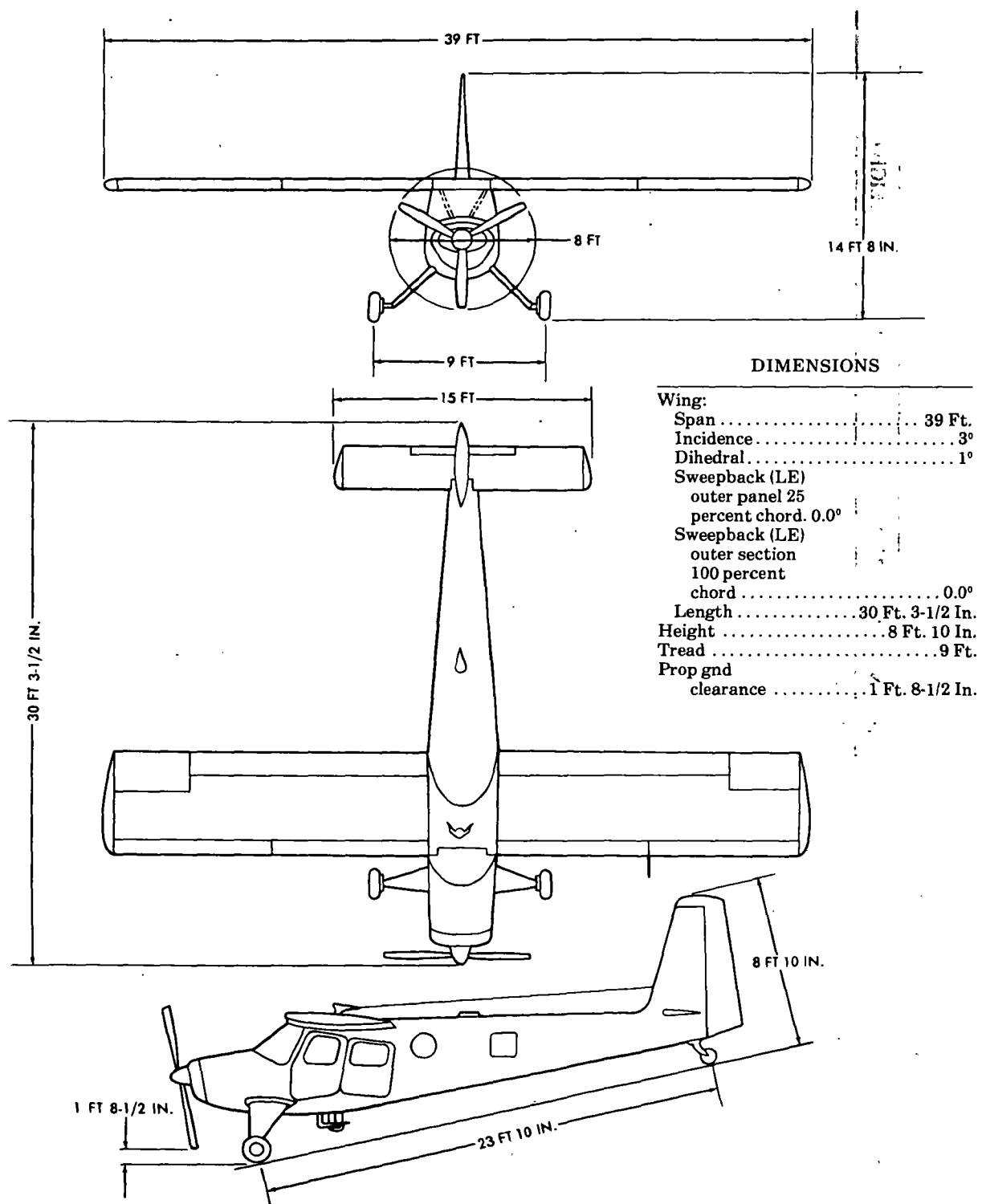


Figure 1-53. Principal Dimensions, U-10A (Helio-Courier)

1-83 . U-10A (Helio Courier) Characteristics.

ENGINE	MISSION AND DESCRIPTION		WEIGHTS
No. & model .....(1) GO-480-G1D6 Engine spec No ....2227B Superch .....NA Red. gear ratio ....0.641 (77:120) Prop mfr .....Hartzell Blade design No ....B3Z20-1/10151c-5 Prop type .....Hydraulic, constant speed No. blades .....3 Prop dia .....8 ft Prop type certificate No.....P-907-10	Mfr's Model: Helio-Courier Basic mission assignments of the U-10A aircraft include courier, observation, cargo carrying, parachute delivery and small groups, radio relay for extended periods of time, evacuation, and utility transport. The U-10A is a versatile air vehicle in the STOL category specifically designed to utilize small, rough, and unprepared fields and offering a maximum of protection for pilot and crew. Adaptability to floats and skis enables the airplane to operate on water and snow. The U-10A is an all-metal, high-wing, conventional-gear, four-place aircraft. The aerodynamic characteristics feature such items as long-span, high-lift type slotted flaps, and full-span leading edge slots. Lateral control is obtained by short-span, Frise-type, balanced ailerons which are operated in conjunction with leading edge spoilers. Ailerons alone are used for lateral control at higher speed. The airplane has an all-movable, slab-type, horizontal stabilizer with antibalance tab and a large vertical stabilizer and rudder. The U-10A is powered by a six-cylinder engine splined to a three-bladed propeller with a constant-speed control and spinner to aid engine cooling.		LB Empty 2249 Max takeoff (normal) 3000 Max takeoff (overload) ... 3920
ENGINE RATINGS		FUEL AND OIL	
BHP RPM Takeoff 295 3400 Normal 280 2750		Fuel: Grade 115/145 Spec MIL-G-5572 No. tanks: Wing, left (1) 30 gal Wing, right (1) 30 gal Qty 60 gal Oil: Spec Temps above +30°F MIL-L-22851 Type II Temps below +30°F MIL-L-22851 Type III No. tanks 1 Location Engine sump Qty 2-1/2 gal	
TECHNICAL PUBLICATIONS		AVIONICS/ARMAMENT	
AIRFRAME: Commercial Manuals (Contractor Supported) ENGINE: Commercial Manual	FEATURES	PERSONNEL	Refer to chapter 2.
	Adaptable to floats & skis STOL type aircraft	Crew (normal) (pilot, copilot) 2 Passengers 2	FLYAWAY COSTS/NSN
		NSN 1510-00964-9780 LIN A 30971 COSTS, \$55,824	

1-84. Loading and Performance - Typical Mission, U-10A (Helio Courier).

CONDITIONS	BASIC MISSION
Max speed at SL (kn) ...	145
Max speed, 5000 ft (kn) ...	142
Min speed, power off, 40-deg flaps (kn) ...	42
Performance cruise at 6000 ft, 74-percent power, 2750 rpm (kn) ...	139
Range at 139 kn (nmi) ...	436 (no reserve)
Extended range cruise at 10,000 ft, 49-percent power, 2200 rpm (kn) ...	121
Range at 121 kn (nmi) ...	700 (no reserve)
Max endurance at 5000 ft, 29-percent power, 75 in TAS (hr) ...	9.14 (no reserve)
Service ceiling (100 fpm R/C) (ft) ...	22,000
Takeoff data at SL, 0 wing, 25-deg flaps, paved runway:	
Takeoff weight (lb) ...	3000
Ground roll (ft) ...	290
Total distance over 50-ft obstacle (ft) ...	500
Landing data at SL, 0 wind, 40-deg flaps, paved runway:	
Ground roll (ft) ...	180
Total distance over 50-ft obstacle (ft) ...	495

Source: DRSTS-WP

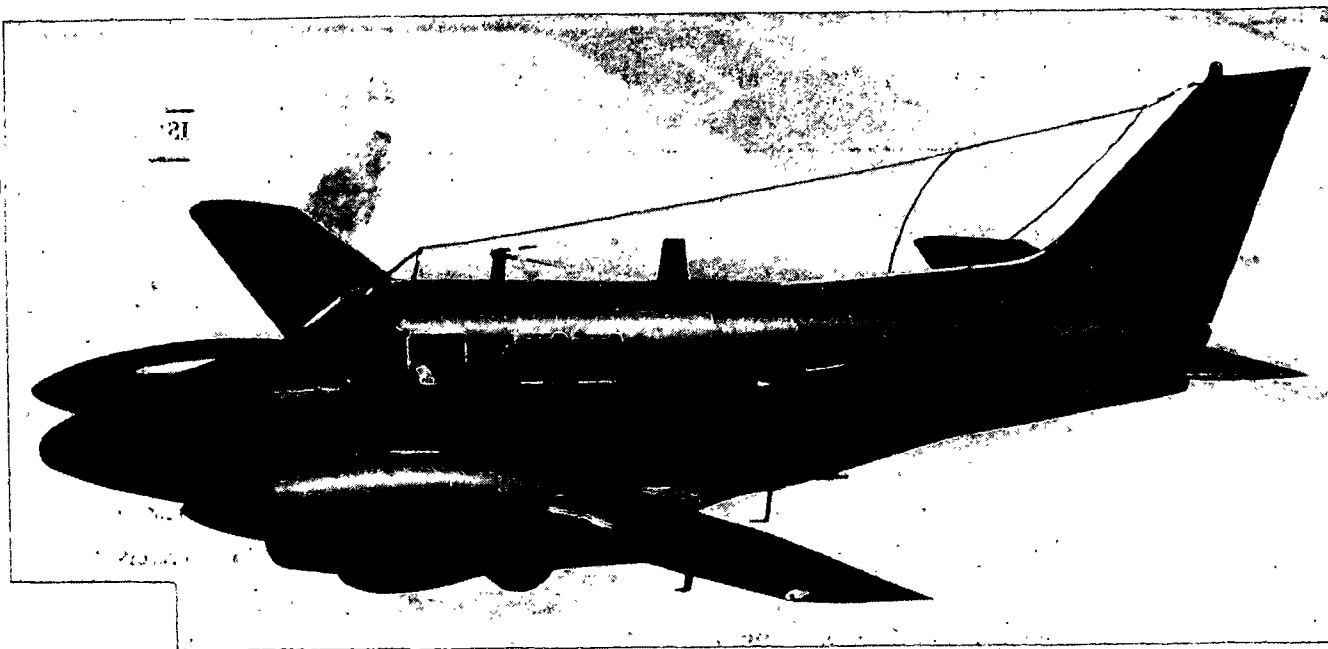


Figure 1-54. U-21 and RU-21 (Ute) (paint scheme differences)

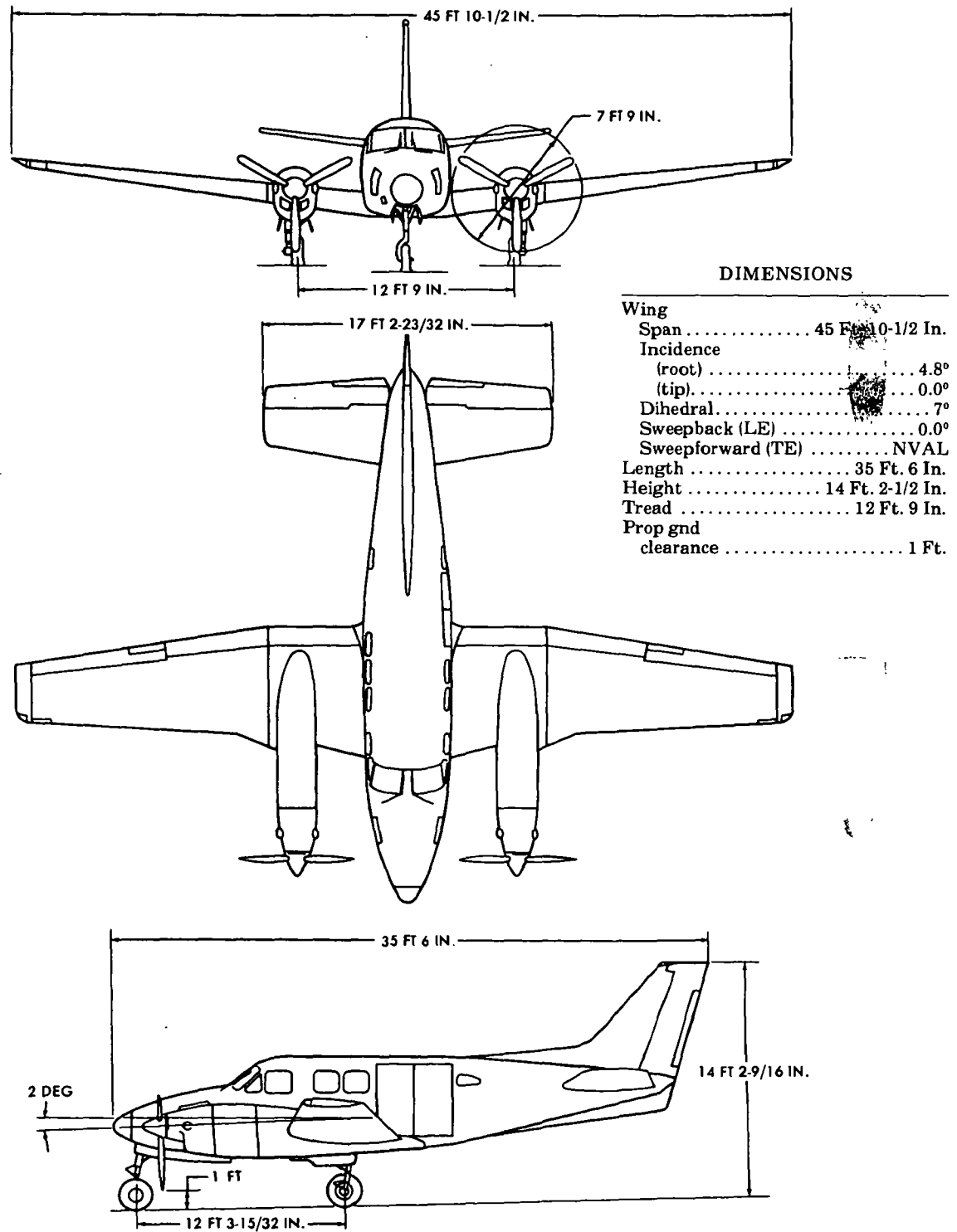


Figure 1-55. Principal Dimensions, U-21A, U-21G, (Ute)

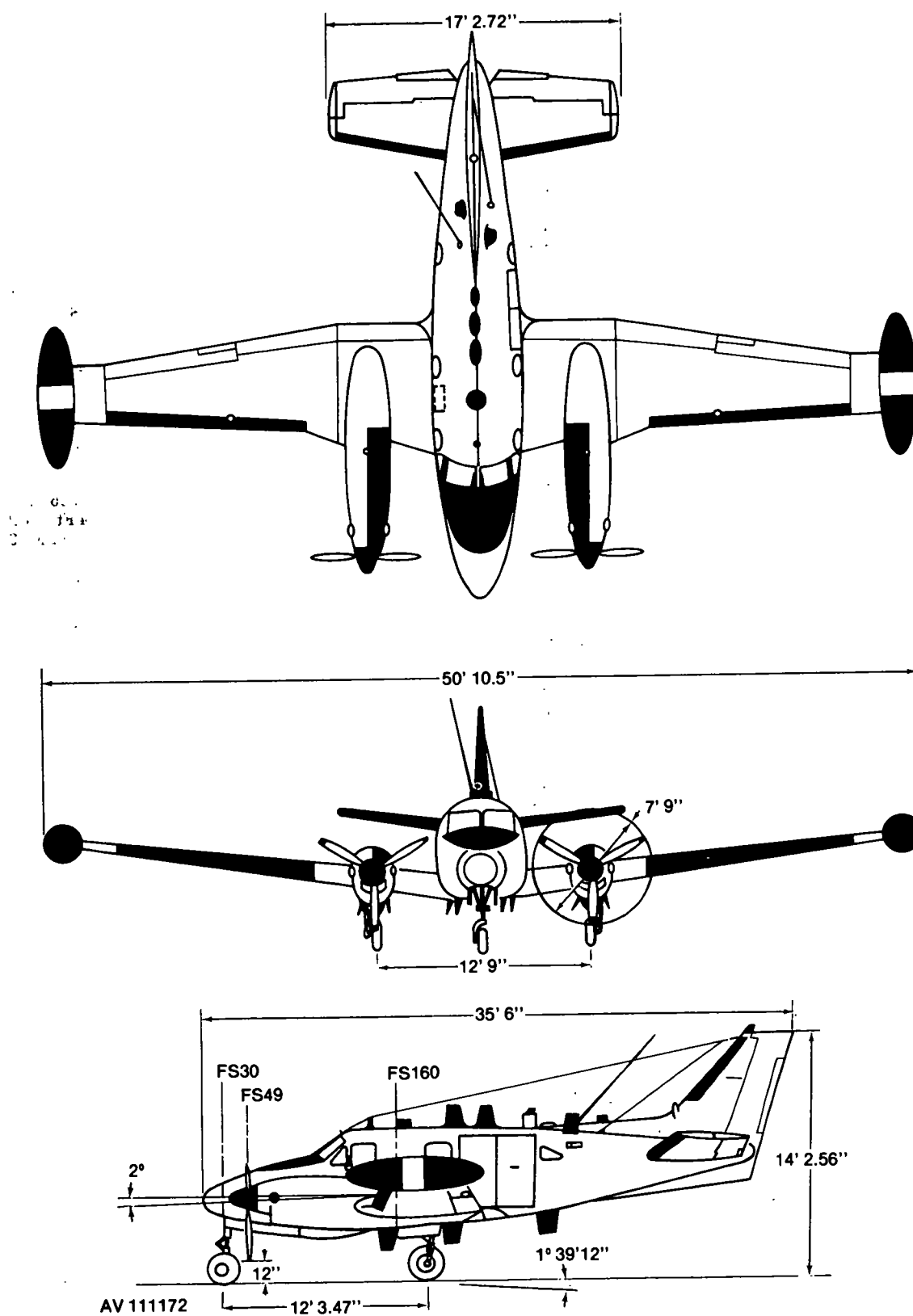


Figure 1-56. Three View Drawing and Dimensions (RU-21A)

ENGINE	MISSION AND DESCRIPTION	WEIGHTS
No. & model (2) T74-CP-700 (PT6A-20) Mfr UACL Type Turboprop Prop mfr Hartzell Prop type Hyd, CS, FF No. blades 3 Prop dia 7 ft. 9 in.	Mfr's Model: Beech Aircraft Corporation 65-A90-1 The U-21A is an off-the-shelf utility aircraft. The first production aircraft was tested by USATECOM for confirmation. The U-21A is an unpressurized, low wing, all-metal construction aircraft of versatile design with an all-weather capability. The primary mission of the U-21A is to perform utility services in the combat zone, support commanders and their staff in command and control, administration, liaison and aeromedical evacuation. The basic version of the aircraft is configured for troop transport; however, alternate configurations are available for service as air ambulance, staff transport, or air cargo transport.	Empty LB Gross takeoff 5401 Gross landing 9650 Cargo capacity 9168 3000
ENGINE RATINGS		FUEL AND OIL
Takeoff SHP 550 ALT SL		Fuel: Grade JP4/5 Spec MIL-T-5624 No. tanks ... 10 Location ... (8) wing Qty 256 gal Location ... (2) Nacelle Qty 114 gal Oil: Spec Temps above -40°F MIL-L-23699 Temps below -40°F MIL-L-7808 No. tanks ... 2 Location ... Nacelle. Qty 2.3 gal each tank
TECHNICAL PUBLICATIONS	DEVELOPMENT	
AIRFRAME: TM55-1500-340-PMS TM55-1510-209-10 TM55-1510-209-10-1 TM55-1510-209-CL TM55-1510-209-CL-1 TM55-1510-209-23-1&2 TM55-1510-209-23P-1&2 TM-1-U21-S	Date of contract 30 September 1966 Contracting agency AVSCOM No. of test aircraft 3 First flight (scheduled) March 1967 Completion of test and evaluation July 1967 Contract delivery schedule 2 April 1967 23 May 1967 23 June 1967	
ENGINE TM55-2840-232-23P TM55-2840-232-24 TM55-2840-120 (DMWR)	FEATURES Cabin heating and ventilating system. Deicing and anti-icing system. Rotating beacon light. Steerable nose wheel. Controllable pitch, full feathering, and reversible props.	PERSONNEL Pilot 1 1/Passengers 6 or 2/Troops 10 or Litter patients 3 plus Ambulatory patients 3 plus Attendant 1 1/ Normal seats 2/Combat - equipped RU-21A Pilot 1 Co-Pilot 1 Equip. Operators 2
		AVIONICS/ARMAMENT Refer to chapter 2.
		FLYAWAY COSTS/NSN U-21A NSN 1510-00933-8223 LIN A30946 COSTS, \$348,844 RU-21A NSN 1510-00587-3375 LIN A30582 COSTS, \$587,004

RU-21A: U-21A Modified for installation of special mission EW equipment.

1-86. RU-21D (UTE) Characteristics.

ENGINE	MISSION AND DESCRIPTION		WEIGHT
No. & model (2) T74-CP-700 (P6A-20) Mfr UACL Type Turboprop Prop mfr Hartzell Prop type Hyd, CS, FF No. blades 3 Prop dia 7 ft. 9 in.	Mfr's Model: Beech Aircraft Corporation 65-A90-1 The RU-21D is a U-21A aircraft modified to carry special mission equipment. The RU-21D is a unpressurized, low wing, all-metal construction aircraft of versatile design with an all-weather capability. The primary mission of the RU-21D is to perform special missions in the combat zone.		LB Empty (wet) 6497 Gross takeoff 9650 Gross landing 9168 Cargo capacity 3000
ENGINE RATINGS	DEVELOPMENT		FUEL AND OIL
Takeoff SHP 550 ALT SL TECHNICAL PUBLICATIONS AIRFRAME: TM55-1510-209-10-1 TM-55-1510-209-23-1 TM-55-1510-209-23-2 TM-55-1510-209-23P-1 TM-55-1510-209-23P-2 TM55-1500-209-CL-1 TM55-1500-34-PMS TM-1-U21-S ENGINE: TM-55-2480-232-23P TM-55-2480-232-24 DMWR-55-2840-120	RU-21D Date of contract 2 FEB 68 Contracting agency AVSCOM No. of test aircraft First flight (scheduled) MAY 68 Completion of test and evaluation Contract delivery schedule JUL 68 OCT 68		Fuel: Grade JP4/5 Spec MIL-T-5624 No. tanks 10 Location (8) wing Qty 256 gal Location (2) Nacelle Qty 114 gal Oil: Spec Temps above 40oF MIL-L-23699 Temps below 40oF MIL-L-7808 No. tanks 2 Location Nacelle Qty 2.3 gal each tank
	FEATURES	PERSONNEL	
	Cabin heating and ventilating system. Deicing and anti-icing system. Rotating beacon light. Steerable nose wheel. Controllable pitch, full feathering, and reversible props.	Pilot 1 Co-Pilot 1 Equipment Operators 2	AVIONICS/ARMAMENT Refer to chapter 2. FLYAWAY COSTS/NSN NSN 1500-00804-3641 LIN A30585 COSTS \$875,004

1-87. Performance - Typical Mission, U-21A (UTE).

Payload	(lb) ..	2000 ^{1/}
Range	(nmi) ..	1249
Cruise speed ^{2/}	(kn) ..	180
Max speed	(kn) ..	230
Min takeoff distance	(ft) ..	1000
Min landing distance	(ft) ..	800
Rate of climb (1 engine)	(fpm) ..	350
Service ceiling (2 engines)	(ft) ..	25,000
Service ceiling (1 engine)	(ft) ..	10,000

^{1/} 3000 lb with fuel trade off.

^{2/} True airspeed at normal rated power.

Source: DRSTS-WP

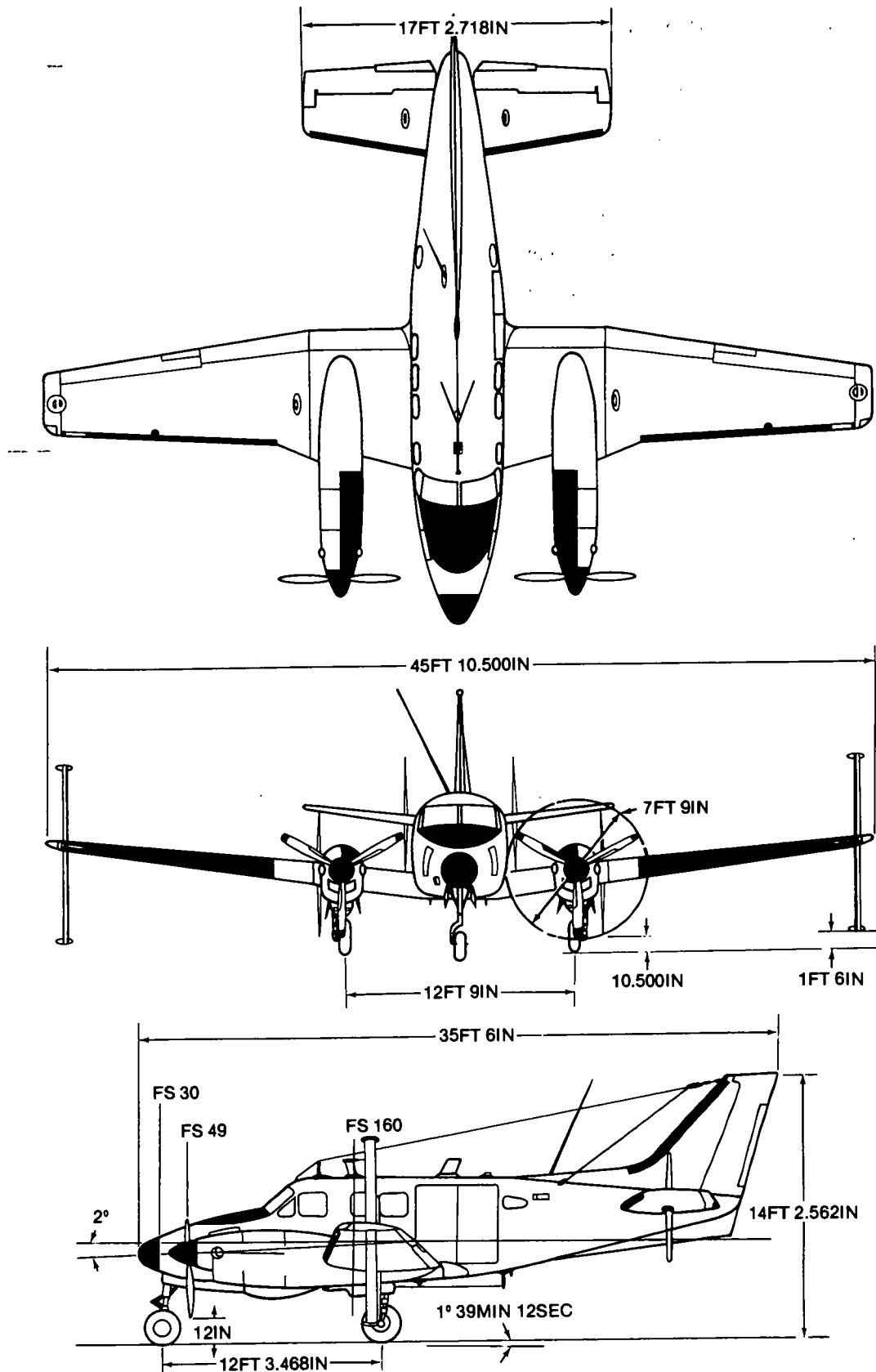


Figure 1-57. Principal Dimensions Diagram RU-21D

1-88 . Performance - Typical Mission, RU-21D (UTE).

Payload	(lb) ..	1,767 <u>1/</u>
Range	(nmi) ..	800
Cruise speed <u>2/</u>	(kn) ..	176
Max speed	(kn) ..	230
Min takeoff distance	(ft) ..	1,700
Min landing distance	(ft) ..	1,280
Rate of climb (1 engine)	(fpm) ..	410
Service ceiling (2 engines)	(ft) ..	25,750
Service ceiling (1 engine)	(ft) ..	9,100

1/ Mission equipment and two operators.

2/ True airspeed at normal rated power.

Source: DRCPM-AEL (2)

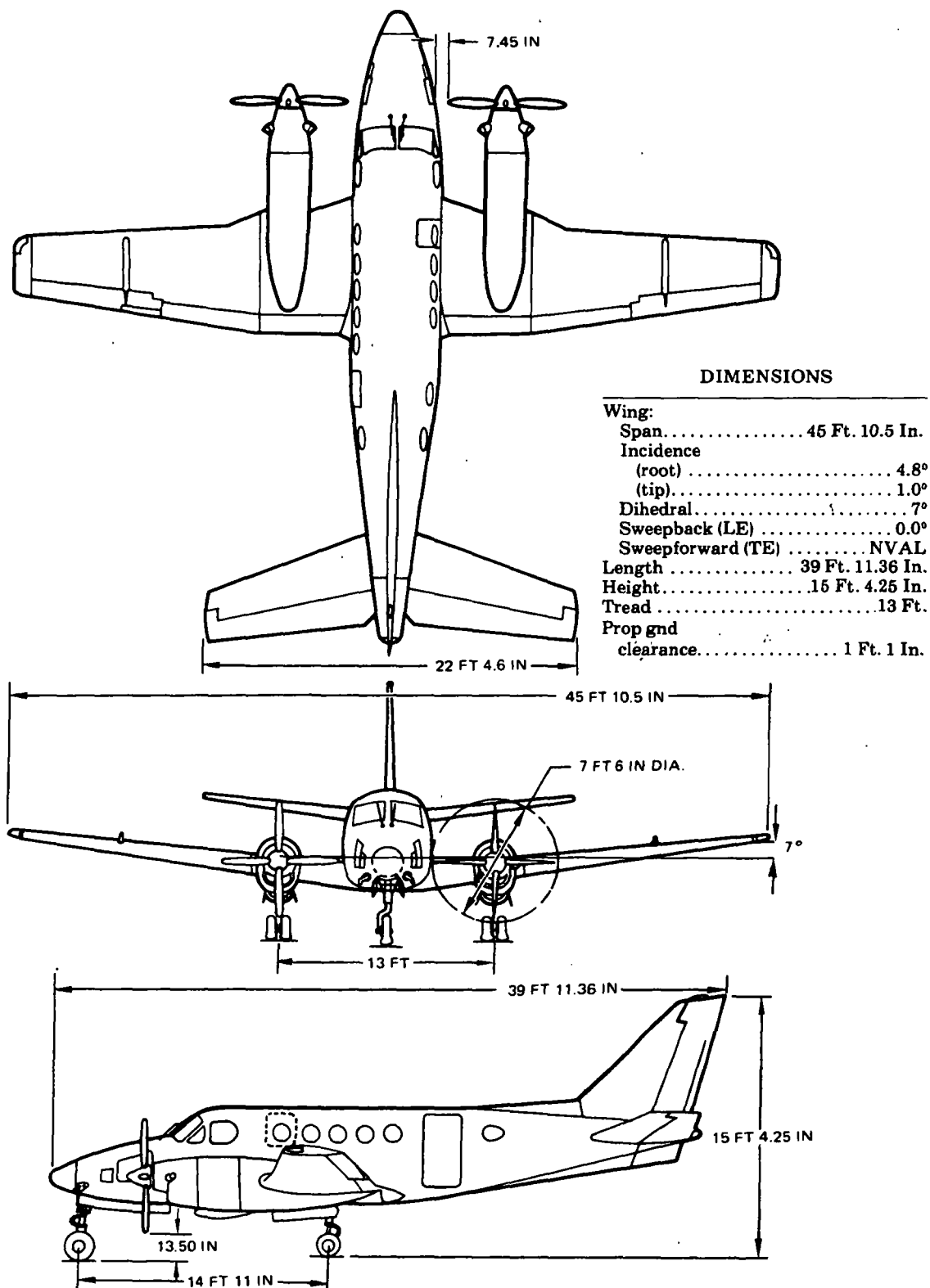


Figure 1-56. Principal Dimensions U-21F (Ute)

ENGINE	MISSION AND DESCRIPTION	WEIGHTS
No. & model (2) PT6A-28 Mfr UACL Type Turboprop Prop mfr Hartzell Prop type Hyd, CS, FF No. blades 4 Prop dia 7 ft. 6 in.	Mfr's Model: Beech Aircraft Corporation A100 The U-21F is an off-the-shelf utility aircraft. The U-21F is a pressurized, low wing, all-metal construction aircraft of versatile design with an all-weather capability. The primary mission of the U-21F is to transport high ranking military and government officials.	LB Empty (wet) 6790 Gross takeoff 11,500 Gross landing 11,210
ENGINE RATINGS		FUEL AND OIL
Takeoff SHP 680 ALT SL	DEVELOPMENT	Fuel: Grade JP4/5 Spec MIL-T-5624 No. tanks 14 Location 10 wing Qty 274 gal Location (2) Nacelle Qty 114 gal Location (2) Center Section Qty 82 gal Oil: Spec Temps above -40°F MIL-L-23699 Temps below -40°F MIL-L-7808 No. tanks 2 Location Nacelle Qty 2.3 gal each tank
TECHNICAL PUBLICATIONS	Date of contract 30 JUN 71 Contracting agency AVSCOM No. of test aircraft — First flight (scheduled) MAY 71 Completion of test and evaluation — Contract delivery schedule 30 JUL 71 30 AUG 71	
Commercial Manuals (Contractor Supported)	FEATURES	PERSONNEL
	Cabin heating and ventilating system. Deicing and anti-icing system. Rotating beacon light. Steerable nose wheel. Controllable pitch, full feathering, and reversible props. Pressurized cabin. Air conditioning.	Pilot 1 Co-Pilot 1 Passengers 7
		AVIONICS/ARMAMENT
		Refer to chapter 2.
		FLYAWAY COSTS/NSN
		NSN 1510-00169-0295 LIN A30951 COSTS \$494,800

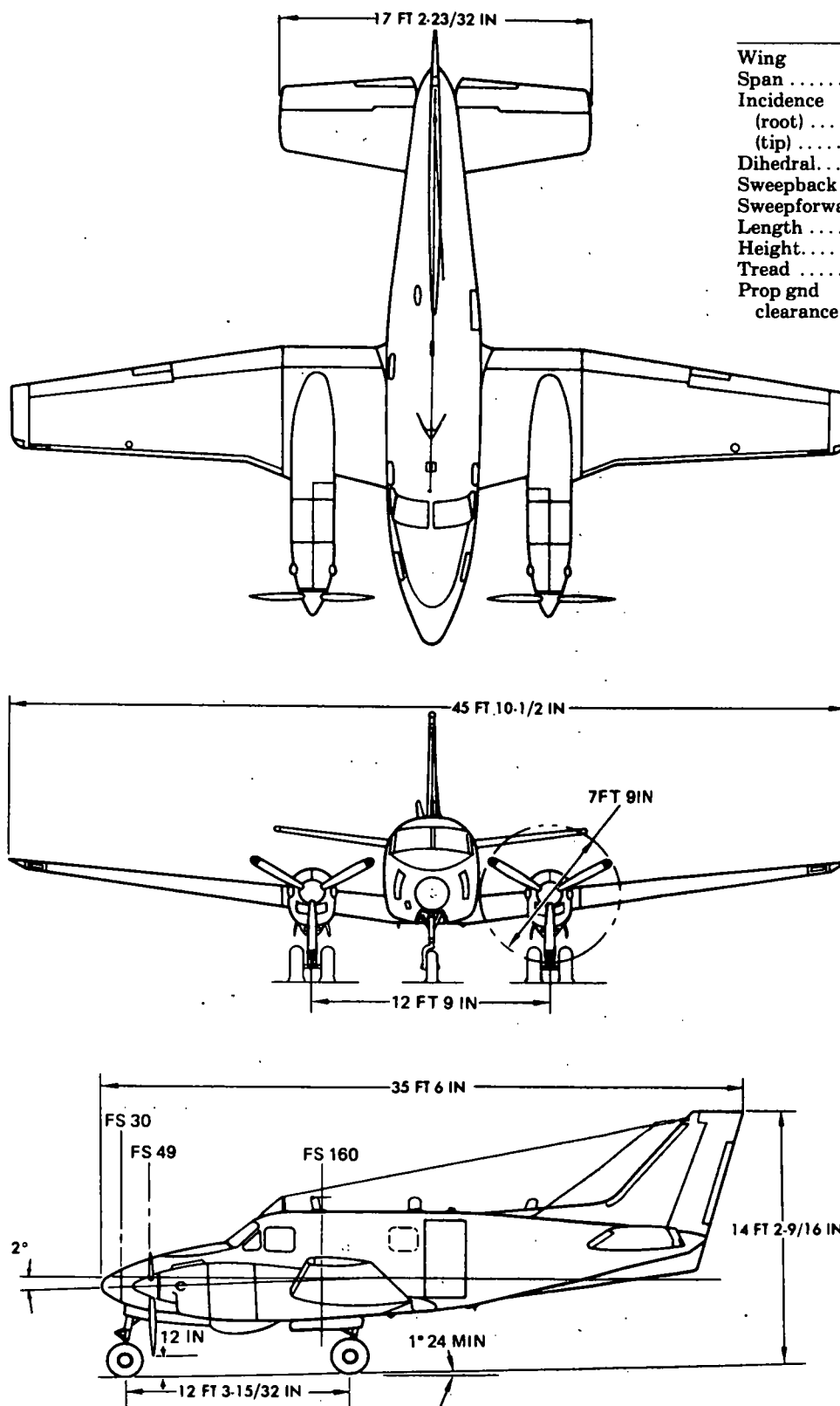
1-90. Performance - Typical Mission, U-21F (UTE).

Payload	(lb) ..	1,400 <u>1/</u>
Range	(nmi) ..	1,000
Cruise speed <u>2/</u>	(kn) ..	236
Max speed	(kn) ..	270
Min takeoff distance	(ft) ..	1,855
Min landing distance	(ft) ..	866
Rate of climb (1 engine)	(fpm) ..	452
Service ceiling (2 engines)	(ft) ..	24,850
Service ceiling (1 engine)	(ft) ..	9,300

1/3000 lb with fuel trade off.

2/True airspeed at normal rated power.

Source: DRSTS-WP



DIMENSIONS

Wing	
Span	45 FT 10-1/2 IN.
Incidence	
(root)	4.8°
(tip)	0.0°
Dihedral	7°
Sweepback (LE)	0.0°
Sweepforward (TE)	NVAL
Length	35 Ft. 6 In.
Height	14 Ft. 2-1/2 In.
Tread	12 Ft. 9 In.
Prop gnd clearance	1 Ft.

Figure 1-57. Principal Dimensions RU-21B and RU-21C (Ute)

ENGINE	MISSION AND DESCRIPTION	WEIGHTS
No. & model (2) T74-CP-702 (PT6A-29) Mfr UACL Type Turboprop Prop mfr Hartzell Prop type Hyd, CS, FF No. blades 3 Prop dia 7 ft. 9 in.	Mfr's Model: Beech Aircraft 65-A90-2 (RU-21B) 65-A90-3 (RU-21C) The RU-21 B & C models are modified U-21A to carry special ASA mission equipment. They have engines with greater SHP, are beefed up to accomodate higher gross weight, and are equipped with dual wheel landing gears.	Empty RU-21B 5955 RU-21C 5907 Gross takeoff 10,900 Gross landing 10,900
ENGINE RATINGS	DEVELOPMENT	FUEL AND OIL
Takeoff SHP 620 ALT SL	Date of contract, Amendment 12 Jun 1967 Contracting agency AVSCOM No. of test aircraft 2 First Flight (Scheduled) Aug 1968 Completion of Test and Evaluation Final test not completed Contract Delivery Schedule (Est Apr 72)	Fuel: Grade JP4/5 Spec MIL-T-5624
TECHNICAL PUBLICATIONS		B MODEL
AIRFRAME: TM55-1500-340-PMS TM-55-1510-214-10 TM-55-1510-214-CL TM-55-1510-214-23 TM-55-1510-209-23P 1&2 TM-1-U21-S		No. Tanks 12 Location (10) Wing Qty 290 gals Location (2) Nacelle Qty 106 gals
ENGINE: TM-55-2840-232-24 TM-55-2840-232-23P		C MODEL
		No. Tanks 12 Location (8) wing Qty 290 gals Location (2) Nacelle Qty 106 gals
		Oil: Spec Below 40°F(25°C) MIL-L-7808 Above 40°F(25°C) MIL-L-23699
		No. tanks 2 Location Nacelle Qty 2.3 gal each tank
		AVIONICS/ARMAMENT
		Refer to chapter 2.
		FLYAWAY COSTS/NSN
		RU-21B NSN 1510-00878-4338 LIN A30583 COSTS \$1,257,811
		RU-21C NSN 1510-00878-4336 LIN A30584 COSTS \$1,259,760

1-92. Performance - Typical Mission, RU-21B/RU-21C (UTE).

Payload	(lb)	1371	$\frac{1}{2}$	B Model
		1658	$\frac{1}{2}$	C Model
Range	(nmi)	940		B Model
		940		C Model
Cruise speed	(kn)	194		
Max speed	(kn)	208		
Min takeoff distance	(ft)	2860		B Model
Min takeoff distance	(ft)	2140		C Model
Min landing distance	(ft)	1750		B Model
Min landing distance	(ft)	1360		C Model
Rate of climb (1 engine)	(fpm)	208		B Model
Rate of climb (1 engine)	(fpm)	365		C Model
Service ceiling (2 engines)	(ft)	20,000		
Service ceiling (1 engine)	(ft)	7,000		

 $\frac{1}{2}$ Mission Equipment**Source: DRCPM-AEL (2)**

DIMENSIONS

Wing	.....
Span	 50 Ft. 11 In.
Incidence	.....
(root)	 4.8°
(tip)	 0.0°
Dihedral	 7°
Sweepback (LE)	 0.0°
Sweepforward	.....
(TE)	 NVAL
Length	 35 Ft. 26 In.
Height	 14 Ft. 2-1/2 In.
Tread	 12 Ft. 9 In.
Prop gnd clearance	 1 Ft.

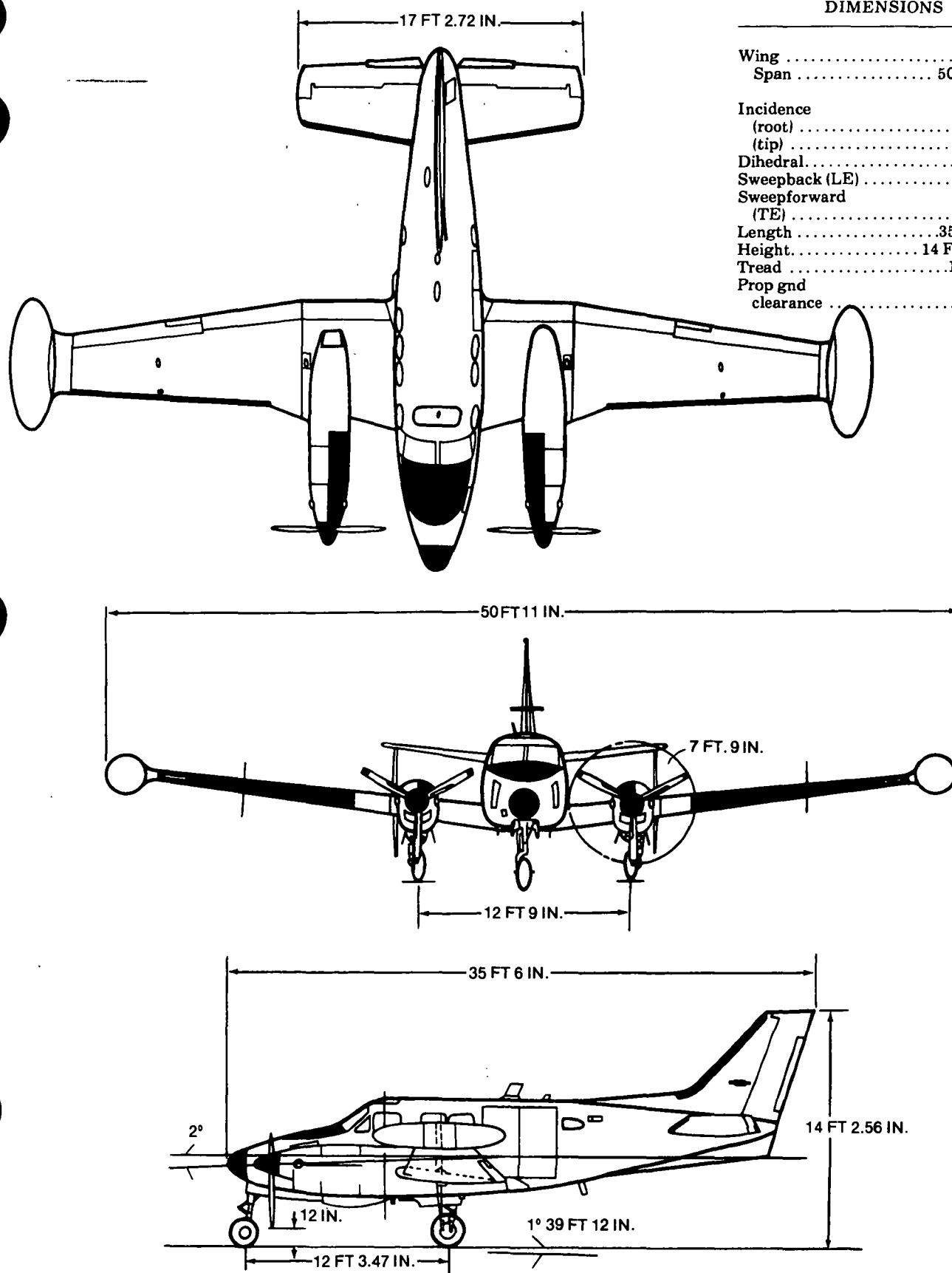


Figure 1-58. Principal Dimensions RU-21H (Guardrail V)

1-93. RU-21H (Guardrail V) Characteristics.

ENGINE	MISSION AND DESCRIPTION		WEIGHTS
No. & model (2) T74-CP-700 (PT6A-20) Mfr UACL Type Turboprop Prop mfr Hartzell Prop type Hyd, CS, FF No. blades 3 Prop dia 7 ft. 9 in.	The RU-21H is an unpressurized, all metal low wing aircraft powered by two T74-CP-700 turboprop engines. Distinguishable features of the acft are the slender, streamline engine nacelles, square-tipped tail services, and swept back vertical stabilizer with ventral fin. Vertically oriented antennas and tip pods are installed on the wings. Cabin entrance and egress is made through an air-stair type door on the left side of the fuselage. An escape hatch is also fitted in the top of the pilots compartment. The primary missions of this acft are signal intelligence and electronic surv. Features include IR paint scheme.		LBS. Basic..... 6480 Gross takeoff..... 10,200 Gross landing 9700 Mission Equip 1000
ENGINE RATINGS			FUEL AND OIL
Takeoff SHP 550 ALT SL			Fuel: Grade JP4/5 Spec..... MIL-T-5624 No. tanks 10 Location (8) wing Qty 256 gal Location..... (2) Nacelle Qty 114 gal Oil: Spec Temps above 32°F..... MIL-L-23699 Temps below 32°F..... MIL-L-7808 No. tanks 2 Location Nacelle Qty 2.3 gal each tank
TECHNICAL PUBLICATIONS	DEVELOPMENT		AVIONICS/ARMAMENT
AIRFRAME: TM-1-U21-S TM-55-1510-215-10-2 TM-55-1510-215-CL-2 TM-55-1510-215-23-1 TM-55-1510-215-23-2 TM-55-1510-209-23P1&2 TM-55-1510-215-PMS TM-55-1500-340-PMS	Date of contract 30 JUN 76 Contracting agency USACERCOM No. of test aircraft PIP First flight (scheduled) N/A Completion of test and evaluation SEP 78 Contract delivery schedule SEP 78-FEB 80		Refer to chapter 2.
	FEATURES	PERSONNEL	FLYAWAY COSTS/NSN
	Cabin heating and ventila- ting system. Deicing and anti-icing system. Rotating beacon light. Steerable nose wheel. Controllable pitch, full feathering, and reversible props. Capacitance Fuel Gaging System	Pilot 1 CoPilot..... 1	NSN 1510-00-3943320 COSTS \$1,501,200.00 LIN Z04570

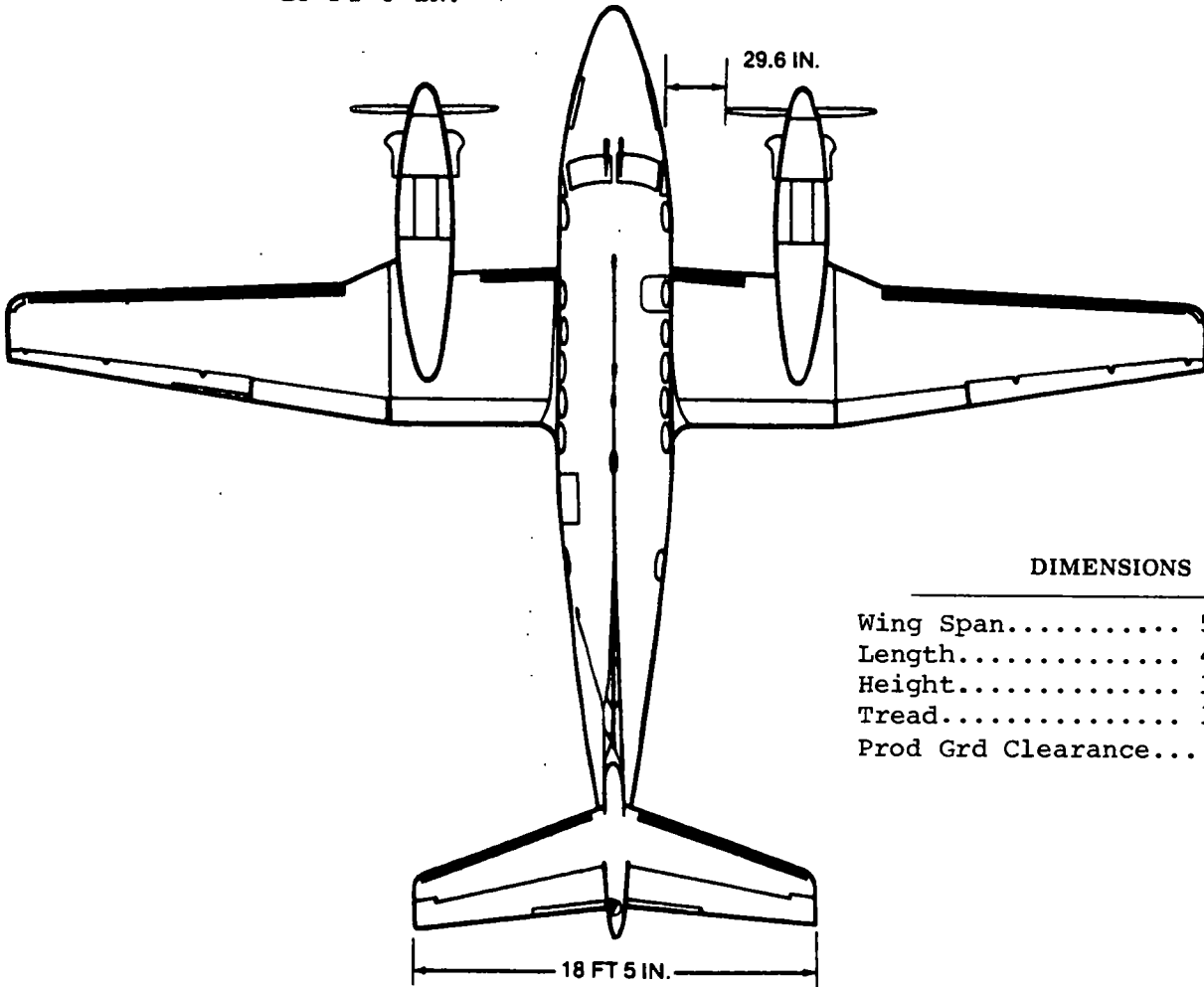
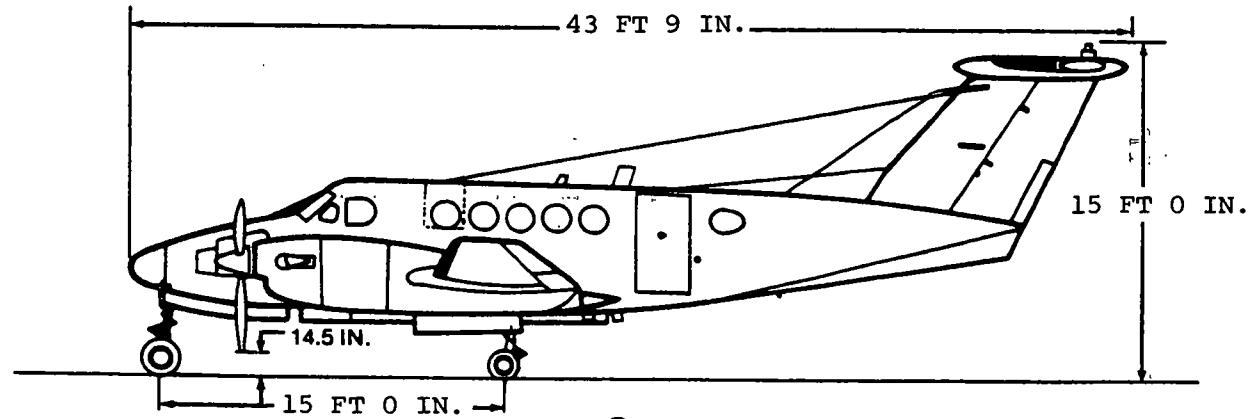
1-94. Performance - Typical Mission, RU-21H (UTE)

Payload	(lb) ..	1,767 <u>1/</u>
Range	(nmi) ..	800
Cruise speed <u>2/</u>	(kn) ..	176
Max speed	(kn) ..	230
Min takeoff distance	(ft) ..	1,700
Min landing distance	(ft) ..	1,280
Rate of climb (1 engine)	(fpm) ..	410
Service ceiling (2 engines)	(ft) ..	25,750
Service ceiling (1 engine)	(ft) ..	9,100

1/ Mission equipment and two operators.

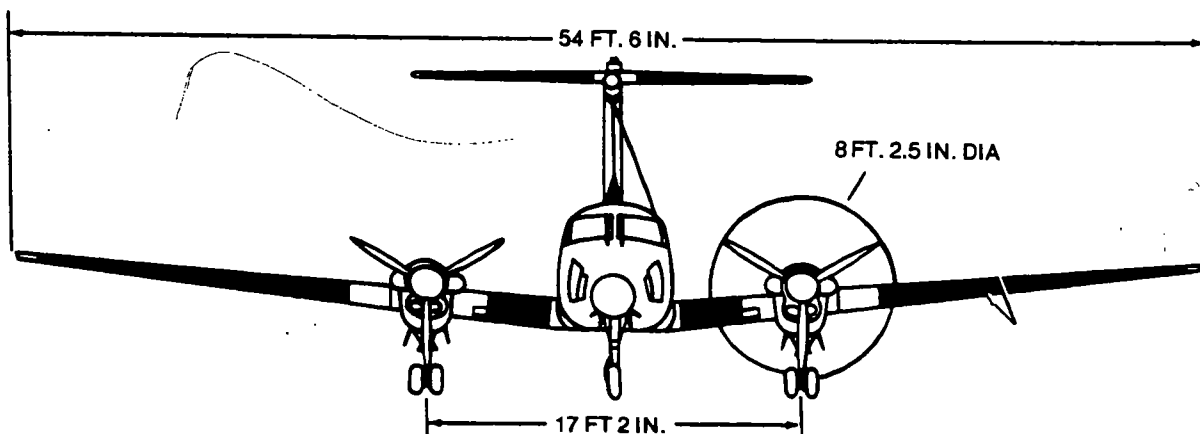
2/ True airspeed at normal rated power.

Source: DRCPM-AEL (2)



DIMENSIONS

Wing Span.....	54 Ft. 6 In.
Length.....	43 Ft. 9 In.
Height.....	15 Ft. 0 In.
Tread.....	17 Ft. 2 In.
Prod Grd Clearance...	1 Ft.



1-95. RU-21J Characteristics

ENGINE	MISSION AND DESCRIPTION		WEIGHTS
No. and Model (2) PT6A-41 Mfr UACL Type Turbo Prop Prop Mfg. Hartzell Prop Type C5 No. Blades 3 Prop Dia. 8 ft. 2½ in.	Mfg. Model: Beech Aircraft Corp A100-1 The RU-21J an off-the-shelf utility aircraft which is totally contractor supported. The RU-21J is an all metal twin turbo prop engine, fixed wing, pressurized cabin, passenger/cargo carrying aircraft. The aircraft is designed and equipped for flight operations under Instrument Flight Rule (IFR) conditions day or night into high density air traffic control zones and into known icing weather conditions. The primary mission of this aircraft is to carry special electronic mission equipment in support of development programs.		LOADING LB: Empty Basic Design Combat Clean Light Scout Heavy Scout Hog Max. Takeoff Max. Landing
ENGINE RATINGS	DEVELOPMENT		FUEL AND OIL
TAKEOFF SHP 850 ALT SL	Date of contract 1971 First flight (Similar aircraft) N/A First acft delivered July 1974		Fuel: Grade JP 4/5 Spec MIL-T-5624 No. tanks 12 Location 10 Wing 2 Nacelle Qty 386 (544 w/ Aux Tanks)
TECHNICAL PUBLICATIONS	FEATURES	PERSONNEL	Oil:
AIRFRAME: Commercial Manuals (Contractor Supported)	All Metal T-Tail Retractable Tricycle with Dual Main Wheel Dual Side by Side Flight Controls	Crew 2 Passengers N/A	Spec MIL-L-23699 No. tanks 2 Location Nacelle Qty 3.5 Gal Each Tank
ENGINE:			AVIONICS / ARMAMENT
			Refer to chapter 2.
			FLYAWAY COSTS / NSN
			NSN 1520-00124-0914 LIN Z04615 \$1,817,888

1-96. Performance — Typical Mission, RU-21J

Payload..... (LB)	
Range (NMI)	
Cruise Speed..... (KN)	
Max Speed (KN)	
Min Takeoff Distance (FT)	
Min Landing Distance..... (FT)	
Rate of Climb (1 Eng) (FPM)	
Service Ceiling (2 Eng) (Ft)	
Service Ceiling (1 Eng)..... (Ft)	

Source: TSARCOM: DRCPM-AEL

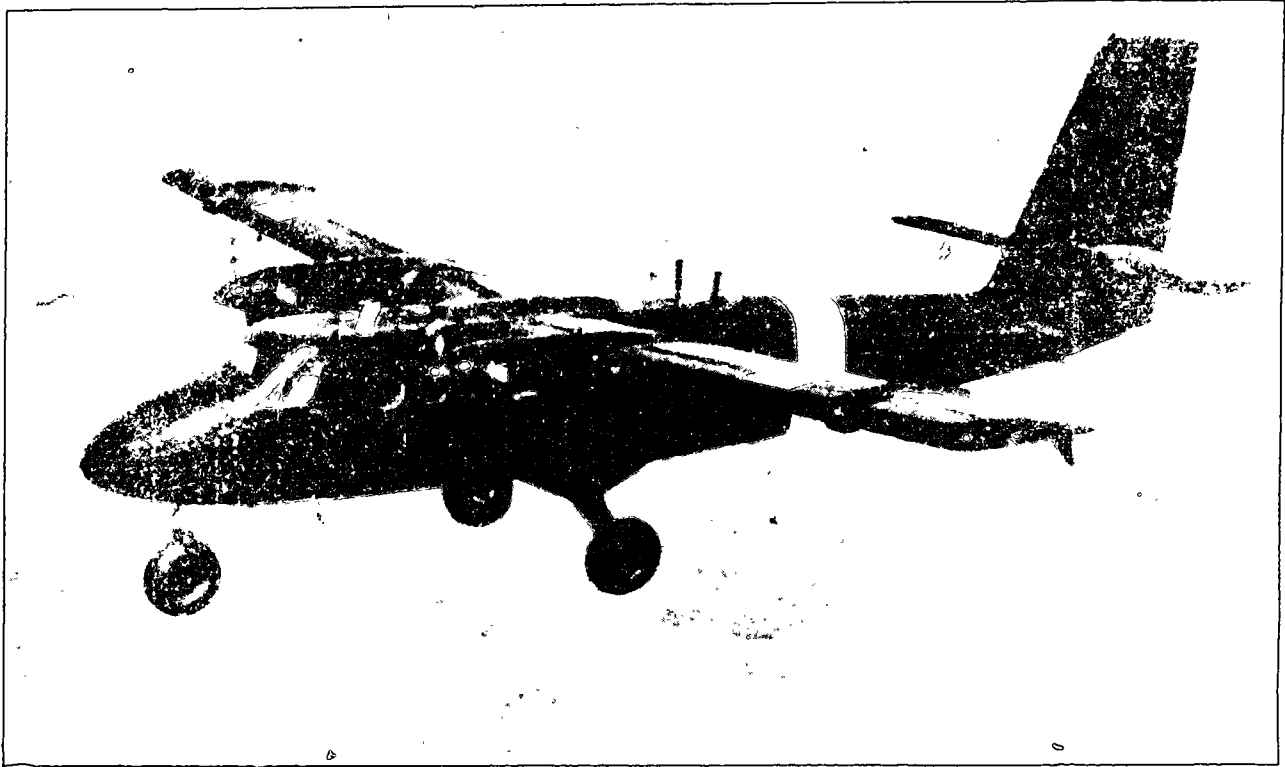


Figure 1-62. UV-18A (Twin Otter)

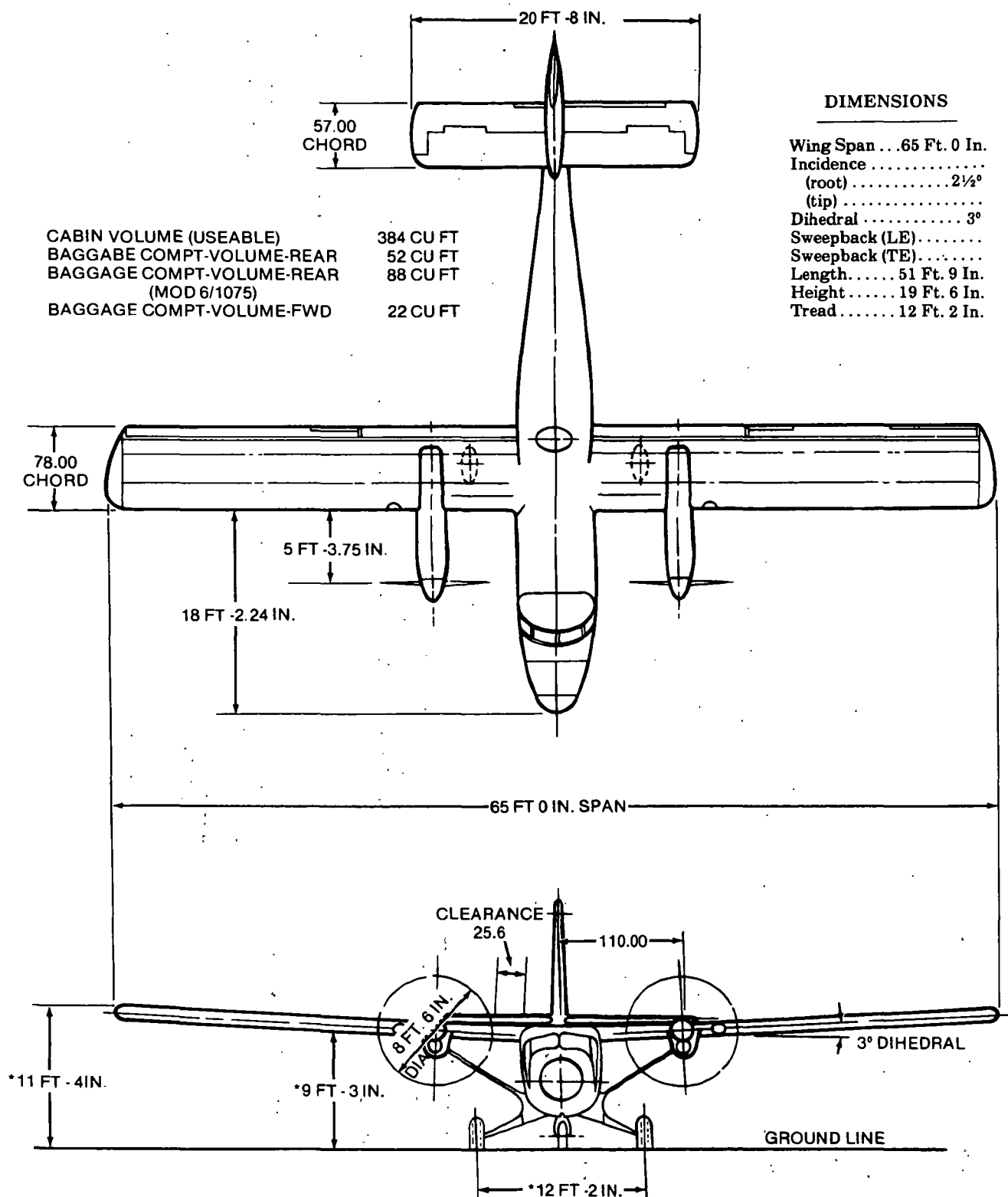


Figure 1-63. Principal Dimensions
 UV-18A (Twin Otter)

1-97. UV-18A Characteristics.

ENGINE			MISSION AND DESCRIPTION		WEIGHTS	
No. and Model (2) PT6A-27 Mfr Canadian P&W Engine Spec. No..... 583 Prop mfg Hartzell Prop type..... C5 No: blades..... 3			The aircraft with a crew of two is capable of carrying twenty passengers with baggage in the utility seating arrangement to provide command : administrative, logistics and personnel flights from battalion headquarters to remote sites throughout western and northern Alaska on a year-round basis. With the utility seats folded a partial or full freight-carrying configuration is available. With necessary adaptations, the aircraft may be used in an air ambulance, rescue, forestry / pipeline patrol and air drops of personnel equipment and supplies missions.		LOADING LB.	
ENGINE RATINGS					Empty	
SHP Condition					Basic	
Take-off 620 ISA+18°C					Design	
Max Cruise 620 ISA+6°C					Combat	
TECHNICAL PUBLICATIONS					Clean	
AIRFRAME: Commercial Manuals (Contractor Supported) ENGINE: Commercial Manual			DEVELOPMENT		Light Scout	
			Date of contract		Heavy Scout	
			First flight (Similar aircraft)		Hog	
			First acft delivered Dec 1976		Max. Takeoff 12,500	
			FUEL AND OIL		Max. Landing 12,300	
					(C) Calculated	
					*For Basic Mission	
					Fuel:	
					Grade JP4/5	
					Spec MIL-J-5624G	
					No. tanks 10	
					Location 8 under floor.	
					2 in Wing	
					Qty 2745 Lbs.	
					Oil:	
					Spec..... MIL-L-23699	
					No. tanks 2	
					Location in Engines	
					Qty.....	
			FEATURES		PERSONNEL	
			All metal, high wing monoplane		Crew 2	
			Fixed tricycle landing gear		Passengers 20	
			Conventional three control, dual side-by-side rudder pedal / control column combination			
					AVIONICS/ARMAMENT	
					Refer to chapter 2.	
					FLYAWAY COSTS/NSN	
					NSN 1510-01011-1462	
					LIN A30989 COSTS	
					\$714,945	

1-98. Performance — Typical Mission, UV-18A (Twin Otter).

Payload.....(LB)	3003 <u>1</u> /
Range .....(NMI)	400
Cruise Speed.....(KN)	181
Max Speed .....(KN)	
Min Takeoff Distance.....(FT)	1200
Min Landing Distance.....(FT)	1050
Rate of Climb (1 Engine).....(FPM)	340
Service Ceiling (2 Engines).....(FT)	26,700
Service Ceiling (1 Engine).....(FT)	11,600

1/4083 Lb with fuel trade off.

Source: DRSTS-WP

CHAPTER 2 LOGISTICS AND MATERIAL

Section I. MAXIMUM ALLOWABLE OPERATING TIME (MAOT) (MAJOR COMPONENTS)

2-1. Major Components.

This section was eliminated since the applicable Technical Manuals (TM's) are now included in Chapter 1, Section IV, Standard Aircraft Characteristics. The TM is more current and in more detail than FM 101-20. Refer to the characteristics pages of each individual aircraft in Section IV. The -20, Chapter 3 of the applicable TM lists all Maximum Allowable Operating Time (MAOT) and Time Between Overhaul (TBO).

Section II. AIRCRAFT EQUIPMENT

2.2. Avionics and Surveillance Equipment Configurations.*

The following avionics and surveillance configurations are typical and may vary depending on production run, changes incorporated through MWO action, and theater of operation in which the

aircraft is employed. For further details on Army Aircraft configuration, including retrofit objectives, refer to AR 95-71 U.S. Army Avionics or TB43-0123. CERCOM does not maintain configuration information for aircraft which are type classified contingency (U-1, U-6, U-9 etc.) .

*Source: CERCOM (DRSEL-MME-LAE) AND (DRSEL-LE-EA)

The following configuration depicts a typically configured AH-1 (). The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

AH-1

TYPE NUMBER	FUNCTION / NOUN	AH-1G / TH-1G	AH-1S (MOD)	AH-1S (FY 76 THRU 77-22762)	AH-1S (77-22763 THRU 77-23092)	AH-1S (77-23093 THRU 77-23125)			
AM-3209/ASN	Servoamplifier	1	1						
AN/AAS-32	Airborne Laser Tracker				1				
AN/ALQ-144	Countermeasures Set				CPO				
AN/APN-209 (V) 1	Radar Altimeter			¹ 1	1	1			
AN/APR-39 (V) 1	Radar Warning Set			CPO	CPO	CPO			
AN/APX-72	IFF Transponder	1	1	1	1				
AN/ARC-51BX	UHF-AM Radio Set	1	1						
AN/ARC-54/131	VHF-FM Radio Set	1	1						
AN/ARC-114A	VHF-FM Radio Set			1	1	1			
AN/ARC-115A	VHF-AM Radio Set			1	1	1			
AN/ARC-116	UHF-AM Radio Set			² 1					
AN/ARC-134	VHF-AM Radio Set	³ 1	³ 1						

2-2. Avionics and Surveillance Equipment Configuration (Cont).

AH-1		AH-1G / TH-1G	AH-1S (MOD)	AH-1S (FY 76 THRU 77-22762)	AH-1S (77-22763 THRU 77-23092)	AH-1S (77-23093 THRU 77-23125)					
TYPE NUMBER	FUNCTION / NOUN										
AN/ARN-83	ADF Set	1	1								
AN/ARN-89B	ADF Set			1	1	1					
AN/ARN-123(V)3	VOR/MB/GS Set			⁴ CPO	⁴ CPO	⁴ CPO					
AN/ASN-43	Gyro Compass Set	1	1	1	1	1					
AN/ASN-128	Doppler Nav Set					1					
AS-1304/ARN	VOR Antenna			1	1	1					
AS-2285/ARC	FM Comm Antenna	1	1								
AS-3188/ARN											
(214-077-092-1)	GS Antenna			1	1	1					
AS-3204/ARC											
(209-075-550)	VHF-AM Antenna			1	1	1					
AS-3205/ARC											
(205-075-345-3)	FM Homing Antenna			1	1	1					
AT-256A/ARC	UHF Antenna			1	1	1					
AT-640/ARN	MB Antenna			1	1	1					
AT-741/A	IFF Antenna					1					
AT-884/APX	IFF Antenna	1	1	1	1	1					
AT-1108/ARC	VHF-AM/UHF Antenna	1	1								

2-2. Avionics and Surveillance Equipment Configurations (Cont).

AH-1		AH-1G/TH-1G	AH-1S(MOD)	AH-1S(FY 76 THRU 77-22762)	AH-1S(77-22763 THRU 77-23092)	AH-1S(77-23093 THRU 77-23125)					
TYPE NUMBER	FUNCTION/NOUN										
BB-649/A	Battery	1	1	1	1	1					
C-1611/AIC	Intercomm Set	2	2								
C-6347/ASN-43	Compass Control			1	1	1					
C-6533/ARC	Intercomm Set			2	2	2					
C-8157/ARC	Control-Indicator	1	1	1	1	1					
C-10533/APX-100	Control					1					
CN-1314/A	Gyro	1									
CN-1497/A	Gyro		1	1	1	1					
ID-48/ARN	Course Indicator	1	1								
ID-250/ARN	RMI	1	1								
ID-998/ASN	RMI	1	1								
ID-2103/A											
(209-075-660)	Horiz Situation Indicator			1	1	1					
ID-2104/A											
(209-075-661)	Attitude Dir Indicator			1	1	1					
ID-2105/A											
(212-070-180)	RMI			1	1	1					
KIT-1A/TSEC	IFF Computer	CPO	CPO	CPO	CPO	CPO					

2-2. Avionics and Surveillance Equipment Configurations (Cont).

AH-1		AH-1G/TH-1G	AH-1S (MOD)	AH-1S (FY 76 THRU 77-22762)	AH-1S (77-22763 THRU 77-23092)	AH-1S (77-23093 THRU 77-23125)						
TYPE NUMBER	FUNCTION / NOUN											
MC-1	Switch Rate Gyro	1	1									
MD-736/A	Signal Discriminator	2	2									
MT-3513/APX	Mount (TS-1843)	1	1	1	1							
MT-3802/ARC	Mount (KY-28)	1	1	1	1	1						
MT-3949A/U	Mount (KIT-1A)	1	1	1	1	1						
MT-4811/APX-100	Mount (RT-1157)					1						
PP-6508/U	Static Inverter	1										
PP-7274/A	Static Inverter		1	1	1	1						
PU-543/A	Inverter	1	1	1								
RT-1167/APX-100 (V)	IFF Transponder					1						
RT-1167/ARC-164	UHF-AM Radio Set			2 ₁	1	1						
TRU-2A/A	Turn Rate Gyro			1	1	1						
TS-1843/APX	IFF Test Set	1	1	1	1							
TSEC/KY-28	Comm Security Set	CPO	CPO	CPO	CPO	CPO						
206-075-597-1	Audio Threshold System			1	1	1						
209-030-133-3	ADF Sense Antenna	1	1	1	1	1						
209-075-292-1	FM Homing Antenna	1	1									
209-077-203	FM Comm Antenna			1	1	1						

2-2. Avionics and Surveillance Equipment Configurations (Cont).

AH-1		AH-1G / TH-1G	AH-1S (MOD)	AH-1S (FY 76 THRU 77-22762)	AH-1S (77-22763 THRU 77-23092)	AH-1S (77-23093 THRU 77-23125)				
TYPE NUMBER	FUNCTION/NOUN									
570A	SCAS	1	1	1	1	1				
YG 1054D1	Prox Warning System	5 ₁	5 ₁	5 ₁	5 ₁	5 ₁				

NOTES:

1. CPO in FY 76 aircraft.
2. The AN/ARC-116 was installed in lieu of the RT-1167/ARC-164 in a few early FY 76 aircraft.
3. Due to vibration requirements, only the MT-3791C/ARC-134 should be installed as a part of the AN/ARC-134 system.
4. Equipment to be 100% installed in Europe.
5. Equipment installed only in aircraft located at Ft. Bragg, Ft. Campbell, Ft. Hood and Ft. Rucker.

GENERAL NOTES: Configurations shown for all FY 77 aircraft were proposed only, not firm, at the time of this printing.

Present plans call for the conversion of all AH-1 () aircraft to the 77-23093 thru 77-23125 configuration by FY 84.

APPLICABLE AIRCRAFT AVIONICS MANUALS:

TM 11-1520-221 Series (Pertains to AH-1G, S (MOD))
 TM 11-1520-236 Series (Pertains to AH-1S)

2-2. Avionics and Surveillance Equipment Configuration (Cont).

The following configuration depicts a typically configured CH-47(). The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

CH-47

The following configuration depicts a typically configured CH-47(). The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations. CH-47												
		CH-47A (FY 61)	CH-47A (FY 62 THRU 66-086)	CH-47A (66-087 THRU 66-19097)	CH-47B	CH-47C	CH-47D					
TYPE NUMBER	FUNCTION/NOUN											
AM-3209/ASN	Servoamplifier	1	1	1	1	1	1					
AN/APN-209(V)2	Radar Altimeter					1	1					
AN/APR-39(V)1	Radar Warning Set					1	CPO	CPO				
AN/APX-44	IFF Transponder	1										
AN/APX-72	IFF Transponder		1	1	1	1						
AN/ARA-31	FM Antenna Group	1										
AN/ARC-44	VHF-FM Radio Set	1										
AN/ARC-51BX	UHF-AM Radio Set		1	1	1	1						
AN/ARC-54/131	VHF-FM Radio Set		1	1	1	1						
AN/ARC-55	UHF-AM Radio Set	1										
AN/ARC-73	VHF-AM Radio Set	CPO	CPO	CPO	CPO							

2-2. Avionics and Surveillance Equipment Configurations (Cont).

CH-47		CH-47A (FY 61)	CH-47A (FY 62 THRU 66-086)	CH-47A (66-087 THRU 66-19097)	CH-47B	CH-47C	CH-47D						
TYPE NUMBER	FUNCTION/NOUN												
AN/ARC-102	HF-AM Radio Set	CPO	CPO	CPO	CPO	CPO	CPO						
AN/ARC-114	VHF-FM Radio Set						1						
AN/ARC-115	VHF-AM Radio Set						1						
AN/ARC-134	VHF-AM Radio Set					1							
AN/ARN-30E	VOR Set	1	1										
AN/ARN-59	ADF Set	1	1										
AN/ARN-82	VOR Set			1	1	1							
AN/ARN-83	ADF Set			1	1	1							
AN/ARN-89	ADF Set						1						
AN/ARN-123(V)1	VOR/MB/GS Set						1						
AN/ASN-43	Gyro Compass Set		³ 1	1	1	1	1						
AS-1304/ARN	VOR Antenna			1	1	1	1						
AS-1703/AR	FM Comm Antenna		1	1	1	1	1						
AS-1869/ARN	ADF Sense Antenna			1	1	1	1						
AS-1870/ARN	ADF Sense Antenna	1	1										
AS-1922/ARC	FM Homing Antenna		1	1	1	1	1						
AT-326/ARN	GS Antenna					¹ 1	1						
AT-450/ARC	UHF Antenna	1											

2-2. Avionics and Surveillance Equipment Configurations (Cont).

CH-47		CH-47A (FY 61)	CH-47A (FY 62 THRU 66-086)	CH-47A (66-087 THRU 66-19097)	CH-47B	CH-47C	CH-47D						
TYPE NUMBER	FUNCTION/NOUN												
AT-640/ARN	MB Antenna	1	1	1	1	1	1						
AT-740/A	IFF Antenna						1						
AT-884/APX	IFF Antenna	1	1	1	1	1	1						
AT-1108/ARC	VHF-AM/UIHF Antenna		1	1	1	1	1						
BB-432/A	Battery	1	1	1	1	1	1						
C-1611/AIC	Intercomm Set	6	6	6	6	6							
C-4209/ARC	Control (T-366)	1	1	1	1								
C-6533/ARC	Intercomm Set						4 ₆						
C-8157/ARC	Control-Indicator		1	1	1	1	1						
CN-811/ASN	Gyro	5 ₂	5 ₂	5 ₂	5 ₂	5 ₂							
CN-1404/ARN-89	Compensator						1						
CU-942B/ARC	FM Antenna Coupler		1	1	1	1	1						
CU-991/AR	HF Antenna Coupler	CPO	CPO	CPO	CPO	6CPO							
CU-1658/A	HF Antenna Coupler					6CPO	CPO						
CV-1275/ARN	Converter	1	1										
ID-250/ARN	RMI	1	1	1	1	1	1						
ID-998/ASN	RMI	1	1	1	1	1	1						
ID-1347C/ARN	Course Indicator						1						

2-2. Avionics and Surveillance Equipment Configurations (Cont).

CH-47		CH-47A (FY 61)	CH-47A (FY 62 THRU 66-086)	CH-47A (66-087 THRU 66-19097)	CH-47B	CH-47C	CH-47D						
TYPE NUMBER	FUNCTION/NOUN												
J-2	Gyro Compass Set	1	3 ₁										
KIT-1A/TSEC	IFF Computer		CPO	CPO	CPO	CPO	CPO						
M-40A	Mount (CV-1275)	1	1										
MD-736/ A	Signal Discriminator		3	3	3	3							
MT-1142/ARC	Mount (T-366)	1	1	1	1								
MT-1719/AR	Mount (CU-991)	CPO	CPO	CPO	CPO	6 CPO							
MT-2292/ARN	Mount (R-1041)	1	1	1	1	1							
MT-2641/ARC	Mount (AN/ARC-102)	10 ₁	10 ₁	10 ₁	10 ₁	10 ₁	10 ₁						
MT-3513/APX	Mount (TS-1843)		1	1	1	8 ₁							
MT-3772/A	Mount (CU-1658)					6 CPO	CPO						
MT-3802/ ARC	Mount (KY-28)		1	1	1	1	1						
MT-3949A/U	Mount (KIT-1A)		1	1	1	1	1						
PP-2792/ARN-30	Power Supply	1	1	1	1								
R-1041/ARN	MB Receiver	CPO	CPO	CPO	CPO	CPO							
R-1963/ARN	MB/GS Receiver					1 ₁							
RT-1167/ARC-164	UHF-AM Radio Set					7 ₁	1						
RT-1285/APX-100	IFF Transponder					2 ₁	1						

2-2. Avionics and Surveillance Equipment Configurations (Cont).

CH-47		CH-47A (FY 61)	CH-47A (FY 62 THRU 66-086)	CH-47A (66-087 THRU 66-19097)	CH-47B	CH-47C	CH-47D					
TYPE NUMBER	FUNCTION/NOUN											
T-366/ARC	VHF-AM Transmitter	1	1	1	1							
TS-1843/APX	IFF Test Set		1	1	1	⁸ 1						
TSEC/KY-28	Comm Security Set		CPO	CPO	CPO	CPO	CPO					
TSEC/KY-58	Comm Security Set				⁹ CPO	⁹ CPO						
114E2186-()	Speed Trim Amplifier	1	1	1	1	1	1					
114E3030-()	SAS Amplifier	2	2	2	2	2	2					
114E3094-()	HF Antenna	CPO	CPO	CPO	CPO	CPO	CPO					
9000F	Gyro						2					
YG1054D1	Proximity Warning System				¹¹ 1	¹¹ 1						

2-2. Avionics and Surveillance Equipment Configurations (Cont).

NOTES:

1. Proposed retrofit installation.
2. Proposed retrofit replacement for AN/APX-72.
3. The AN/ASN-43 was installed in lieu of J-2 starting with FY 65 aircraft.
4. May be replaced by C-10414/ARC.
5. The SBU-6A and 9000F gyros are acceptable substitutes and may be installed in lieu of the CN-811.
6. Provisions for the CU-1658 and MT-3712 were installed in CH-47C aircraft starting with 68-15835. Prior aircraft have provisions for the CU-991 and MT-1719.
7. Proposed retrofit replacement for AN/ARC-51.
8. Not required when AN/APX-100 is installed.
9. Proposed retrofit replacement for KY-28.
10. Used in lieu of PP-3702/ARC-102.
11. Equipment installed only in aircraft located at Ft. Bragg, Ft. Campbell, Ft. Hood and Ft. Rucker.

GENERAL NOTE: The configuration shown for the CH-47D was proposed only, not firm, at the time of this printing.

APPLICABLE AIRCRAFT AVIONICS MANUALS:

TM 11-1520-209 Series.

2-2. Avionics and Surveillance Equipment Configurations (Cont).

The following configuration depicts a typically configured CH-54 (). The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

CH-54

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).

CH-54		CH-54A	CH-54B																
TYPE NUMBER	FUNCTION/NOUN	CH-54A	CH-54B																
*SN-441/ASW	Synchronizer		2																
*SN-442/ASW	Synchronizer		2																
TS-1843/APX	IFF Test Set	1	1																
TSEC/KY-28	Comm Security Set	CPO	CPO																
6460-65010-041	ADF Sense Antenna	1	1																

* Denotes components of Automatic Flight Control System (AFCS) installed on the CH-54B. Some of these items are components of the AN/ASW-29 AFCS installed on the CH-54A.

NOTES:

1. Proposed retrofit installation.
2. Provisions for the CU-991 and MT-1719 were installed in 66-18408 thru 66-18413. All other CH-54A aircraft have provisions for the CU-1658 and MT-3772.
3. Proposed retrofit replacement for AN/ARC-51.

APPLICABLE AIRCRAFT AVIONICS MANUALS:

TM 11-1520-217 Series

2.2. Avionics and Surveillance Equipment Configurations (Cont).

The following configuration depicts a typically configured OH-6A. The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

OH-6A

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).

NOTES:

1. Proposed retrofit installation.
2. The AN/ARC-51 was installed in lieu of the AN/ARC-116 in some aircraft.
3. Wiring provisions exist for 2 each AN/ARC-114, 1 each AN/ARC-115 and 1 each AN/ARC-116. However, the maximum number of sets that can be installed at any given time is limited to 3 each, i.e., 1 each AN/ARC-114, 115 and 116 or 2 each AN/ARC-114 and 1 each AN/ARC-115 or 2 each AN/ARC-114 and 1 each AN/ARC-116.
4. The PP-6376 is a proposed retrofit replacement for the PP-6674 and 369A 4554 inverters.

APPLICABLE AIRCRAFT AVIONICS MANUALS:**TM 11-1520-214 Series**

2-2. Avionics and Surveillance Equipment Configurations (Cont).

The following configuration depicts a typically configured OH-58 (). The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

OH-58

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).**NOTES:**

1. The AN/ARC-51 was installed in lieu of the AN/ARC-116 in some aircraft.
2. Equipment to be 100% installed in Europe.
3. The upper IFF antenna configuration was not firm at the time of this printing. It may be a AT-741 or a contractor selected antenna in lieu of the AT-884. The lower IFF antenna will remain the AT-884.
4. BB-649/A installed as part of winterization kit.
5. Equipment installed only in aircraft located at Ft. Bragg, Ft. Campbell, Ft. Hood and Ft. Rucker.

APPLICABLE AIRCRAFT AVIONICS MANUALS:

TM 11-1520-228 Series

2-2. Avionics and Surveillance Equipment Configurations (Cont).

The following configuration depicts a typically configured TH-55A. The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations. TH-55A		TH-55A											
TYPE NUMBER	FUNCTION/NOUN												
MX-1646/AIC	Headset Adapter	1											
A-25A	VHF Comm Antenna	1											
12-GCAB-9E	Battery	1											
524A	VHF-AM Radio Set	1											

APPLICABLE PUBLICATIONS:
DA Publications are not available.

2-2. Avionics and Surveillance Equipment Configurations (Cont).

The following configuration depicts a typically configured UH-1 () /EH-1 (). The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

UH-1

TYPE NUMBER	FUNCTION/NOUN	UH-1B/C/M (THRU 66-15105)	UH-1B/C/M (66-15106 & SUB)	UH-1D/H (THRU 66-16306)	UH-1D/H (66-16307 THRU FY 70)	UH-1D/H (FY 71 - FY 74)	UH-1V (Note 10)	EH-1H/X					
AM-3209/ASN	Servoamplifier ✓	1	1	1	1	1		1					
AN/APN-209(V)2	Radar Altimeter						1 ₁						
AN/APX-72	IFF Transponder ✓	1	1	1	1	1		1					
AN/ARC-51BX	UHF-AM Radio Set ✓	1	1	1	1	1		1					
AN/ARC-54/131	VHF-FM Radio Set #1 ✓	1	1	1	1	1		1					
AN/ARC-73	VHF-AM Radio Set ✓	CPO		CPO									
AN/ARC-102	HF-AM Radio Set	CPO	CPO	² CPO	CPO	CPO							
AN/ARC-114	VHF-FM Radio Set #2	CPO	CPO	CPO	CPO	CPO		CPO					
AN/ARC-115	VHF-AM Radio Set	³ 1		³ 1		1							
AN/ARC-134	VHF-AM Radio Set		1		1			1					
AN/ARN-30	VOR Set	⁴ 1		⁴ 1									
AN/ARN-59	ADF Set	⁴ 1		⁴ 1									

2-2. Avionics and Surveillance Equipment Configurations (Cont).

UH-1		UH-1B/C/M (THRU 66-15105)	UH-1B/C/M (66-15106 & SUB)	UH-1D/H (THRU 66-16306)	UH-1D/H (66-16307 THRU FY 70)	UH-1D/H (FY 71 - FY 74)	UH-1V (Note 10)	EH-1H/X				
TYPE NUMBER	FUNCTION/NOUN											
AN/ARN-82	VOR Set	4 ₁	1	4 ₁	1	1		1				
AN/ARN-83	ADF Set	4 ₁	1	4 ₁	1	1		1				
AN/ARN-124	DME Set						1 ₁					
AN/ARQ-33	Countermeasures Set							1				
AN/ASN-43	Gyro Compass Set		5 ₁		5 ₁	1		1				
AS-1304/ARN	VOR Antenna	1	1	1	1	1		1				
AS-1703/AR	FM Comm Antenna	1	1	1	1	1		1				
AS-1922/ARC	FM Homing Antenna	1	1	1	1	1		1				
AS-3188/ARN	GS Antenna		1 ₁		1 ₁	1 ₁		1 ₁				
AT-640/ARN	MB Antenna	1	1	1	1	1		1				
AT-884/APX	IFF Antenna	1	1	1	1	1	2	1				
AT-1108/ARC	VHF-AM/UHF Antenna	1	1	1	1	1		1				
BB-433A/A	Battery	1	1	1	1	1		1				
C-1611/AIC	Intercomm Set	4	4	4	4			4				
C-6533/ARC	Intercomm Set					4						
C-8157/ARC	Control-Indicator	1	1	1	1	1		1				
CU-942/ARC	FM Antenna Coupler	1	1	1	1	1						
CU-991/AR	HF Antenna Coupler	CPO	CPO	² CPO	⁶ CPO							

2-2. Avionics and Surveillance Equipment Configurations (Cont).

UH-1		UH-1B/C/M (THRU 66-15105)	UH-1B/C/M (66-15106 & SUB)	UH-1D/H (THRU 66-16306)	UH-1D/H (66-16307 THRU FY 70)	UH-1D/H (FY 71 - FY 74)	UH-1V (Note 10)	EH-1H/X					
TYPE NUMBER	FUNCTION/NOUN												
CU-1658/A	HF Antenna Coupler				⁶ CPO	CPO							
CV-1275/ARN	Converter	4 ₁		4 ₁									
ID-250/ARN	RMI	1	1	1	1	1		1					
ID-998/ASN	RMI	1	1	1	1	1		1					
J-2	Gyro Compass Set	1	5 ₁	1	5 ₁								
KIT-1A/TSEC	IFF Computer	CPO	CPO	CPO	CPO	CPO		CPO					
MC-1	Rate Gyro	11 ₁	11 ₁	11 ₁	11 ₁	11 ₁		11 ₁					
MD-1	Displacement Gyro	1	1	1	1	1		1					
MD-736/AR	Signal Discriminator	4	4	4	4			4					
MT-1719/AR	Mount (CU-991)	CPO	CPO	² CPO	⁶ CPO								
MT-3513/APX	Mount (TS-1843)	1	1	1	1	1		1					
MT-3772/A	Mount (CU-1658)				CPO	CPO							
MT-3802/ARC	Mount (KY-28)	1	1	1	1	1		1					
MT-3949A/U	Mount (KIT-1A)	1	1	1	1	1		1					
PU-543/A	Inverter	2	2	2	2	2		2					
R-1041/ARN	MB Set	CPO	CPO	CPO	CPO	CPO		CPO					
R-1963/ARN	MB/GS Receiver		¹ CPO		¹ CPO	¹ CPO							
RT-1167/ARC-164	UHF-AM Radio Set	7 ₁	7 ₁	7 ₁	7 ₁	7 ₁		7 ₁					

2-2. Avionics and Surveillance Equipment Configurations (Cont).

UH-1		UH-1B/C/M (THRU 66-15105)	UH-1B/C/M (66-15106 & SUB)	UH-1D/H (THRU 66-16306)	UH-1D/H (66-16307 THRU FY 70)	UH-1D/H (FY 71 - FY 74)	UH-1V (Note 10)	EH-1H/X				
TYPE NUMBER	FUNCTION/NOUN											
T-366/ARC	VHF-AM Radio Set	1		1								
TS-1843/APX	IFF Test Set	1	1	1	1	1		1				
TSEC/KY-28	Comm Security Set	CPO	CPO	CPO	CPO	CPO		CPO				
TSEC/KY-58	Comm Security Set	⁸ CPO	⁸ CPO	⁸ CPO	⁸ CPO	⁸ CPO		⁸ CPO				
205-075-325	ADF Sense Antenna	1	1	1	1	1		1				
205-075-399	Audio Threshold System					1						
205-706-027-1	HF Antenna	CPO	CPO	² CPO	CPO	CPO						
206-075-543-3	FM Comm Antenna	1	1	1	1	1		1				
YG1054D1	Proximity Warning System	⁹ 1	⁹ 1	⁹ 1	⁹ 1	⁹ 1						

2-2. Avionics and Surveillance Equipment Configurations (Cont).**NOTES:**

1. Proposed retrofit installation.
2. Provisions for the AN/ARC-102 system are not installed in FY 62 aircraft.
3. Proposed retrofit replacement for AN/ARC-73 and T-366.
4. AN/ARN-30, CV-1275 and AN/ARN-59 installed in UH-1B/C/M through 66-601 and UH-1D/H through FY 65. AN/ARN-82 and AN/ARN-83 installed in subsequent aircraft.
5. J-2 installed in UH-1B/C/M through 66-15147 and in UH-1D/H through 66-16448. AN/ASN-43 installed in subsequent aircraft.
6. Provisions for the CU-1658 and MT-3772 installed in FY 68 and subsequent aircraft.
7. Proposed retrofit replacement for AN/ARC-51.
8. Proposed retrofit replacement for KY-28.
9. Equipment installed only in aircraft located at Ft. Bragg, Ft. Campbell, Ft. Hood and Ft. Rucker.
10. Only UH-1V peculiar avionics are listed. Other installed/CPO items will depend on the TMS of the aircraft selected for UH-1V designation which was not available at the time of this printing.
11. All UH-1 () aircraft were originally delivered with the MC-1 installed. However, it is presently being removed (with no replacement) during depot overhaul.

APPLICABLE AIRCRAFT AVIONICS MANUALS:

TM 11-1520-210 Series (Pertains to UH-1D/H)
TM 11-1520-211 Series (Pertains to UH-1B/C/M)

2-2. Avionics and Surveillance Equipment Configurations (Cont).

The following configuration depicts a typically configured UH-60A. The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

UH-60A

[illegible]

2.2. Avionics and Surveillance Equipment Configurations (Cont).

[illegible]

NOTES:

1. Complete provisions installed for 3 each KY-28 sets.
2. The AN/ARC-115 "Plain" version is not operationally compatible when used with communication security equipment. The AN/ARC-115A (V) 1 must be used.

GENERAL NOTE: The battery and most of the antennas and indicators installed in the UH-60A were furnished by the contractor. Applicable part numbers were not available at the time of this printing.

2-2. Avionics and Surveillance Equipment Configurations (Cont).

The following configuration depicts a typically configured YAH-64. The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

YAH-64A

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).

The following configuration depicts a typically configured C-12A. The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

C-12A

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).

2-2. Avionics and Surveillance Equipment Configurations (Cont).

2-2. Avionics and Surveillance Equipment Configurations (Cont).

[illegible]

NOTES:

1. Equipment installed in overseas areas.
2. The AN/APX-101 is installed in FY 73 aircraft and the AN/APX-100 is installed in all subsequent aircraft.

GENERAL NOTE: The C-12A avionics configuration contains all commercial equipment. As such, data sheets for these items will not appear in this publication. Support of these items is the responsibility of the contractor.

APPLICABLE AIRCRAFT AVIONICS MANUALS:

DA Publications are not available. Refer to applicable commercial literature.

2-2. Avionics and Surveillance Equipment Configurations (Cont).

The following configuration depicts a typically configured OV-1 () /RV-1D. The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

OV-1

TYPE NUMBER	FUNCTION/NOUN	OV-1B	OV-1C	OV-1D	RV-1D															
AN/AAS-14	IR Detecting Set		1																	
AN/AAS-24	IR Detecting Set			4,14 CPO																
AN/ADR-6	Radiac Set			CPO																
AN/AJA-5	Synchrophaser	1	1	1	1															
AN/AKT-18	Data Transmitting Set	1																		
AN/AKT-18A	Data Transmitting Set			2 1																
AN/ALQ-133	Countermeasures Set				CPO															
AN/ALQ-136	Countermeasures Set			1 CPO	1 CPO															
AN/ALQ-147(V)1	Countermeasures Set			CPO																
AN/ALQ-147(V)2	Countermeasures Set				CPO															
AN/ALQ-156	Countermeasures Set			1 CPO	1 CPO															
AN/ALQ-159	Countermeasures Set			1 CPO	1 CPO															

2.2. Avionics and Surveillance Equipment Configurations (Cont).

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).

OV-1																			
TYPE NUMBER	FUNCTION/NOUN	OV-1B	OV-1C	OV-1D	RV-1D														
AN/ARN-89	ADF Set			1	1														
AN/ARN-103	TACAN Set	1	1	1	1														
AN/ART-41A	Data Transmitter		1		1														
AN/ASN-33	Nav Computer Set	1	1	1	1														
AN/ASN-64	Doppler Nav Set	1	1																
AN/ASN-76	Attitude Ref Set	1	1	1	1														
AN/ASN-86	Inertial Nav Set			1	1														
AN/ASW-12	Autopilot Set	1	1	1	1														
AN/AYA-10	Data Annotation System			14 COP															
AN/USQ-61	Digital Data System				CPO														
AS-1703/AR	FM Comm Antenna	1	1																
AS-2042/ARC	FM Homing Antenna	1	1	1	1														
AT-134A/ARN	MB Antenna	6 ₁	6 ₁	6 ₁	6 ₁														
AT-326/ARN	GS Antenna		7 ₁	1	1														
AT-450/A	Data Link Antenna	1	1		1														
AT-741/A	IFF/TACAN Antenna	4	4	4	4														
AT-1108/ARC	VHF-AM/UHF Antenna	1	1	1	1														
BB-433A/A	Battery	1	1	1	1														

2-2. Avionics and Surveillance Equipment Configurations (Cont).

OV-1		OV-1B	OV-1C	OV-1D	RV-1D										
TYPE NUMBER	FUNCTION/NOUN														
C-1611/AIC	Intercomm Set	2	2												
C-6533/ARC	Intercomm Set			2	2										
C-8157/ARC	Control-Indicator	1	1	1	1										
CU-942/ARC	FM Antenna Coupler	1	1												
CU-1658/A	HF Antenna Coupler	CPO	1	1	1										
DT-173/AJN	Magnetic Azimuth Detector	8 ₁	8 ₁	8 ₁	8 ₁										
ID-250/ARN	RMI	9 ₁	9 ₁												
ID-663/U	BDH Indicator	9 ₁	9 ₁	1	1										
KA-60C	Camera		11 CPO	10 CPO											
KIT-1A/TSEC	IFF Computer	CPO	CPO	CPO	CPO										
KS-61A	Photo Surv System	13 CPO	12,13 CPO												
KS-104A	Photo Surv System		12,13 CPO												
KS-104B	Photo Surv System		12,13 CPO												
KS-113A	Photo Surv System			13 CPO											
MD-736/A	Signal Discriminator	CPO	CPO												

2-2. Avionics and Surveillance Equipment Configurations (Cont).

OV-1																			
TYPE NUMBER	FUNCTION/NOUN	OV-1B	OV-1C	OV-1D	RV-1D														
MT-3513/APX	Mount (TS-1843)	1	1	1	1														
MT-3772/A	Mount (CU-1658)	CPO	1	1	1														
MT-3802/ARC	Mount (KY-28)	1	1	1	1														
MT-3949A/U	Mount (KIT-1A)	1	1	1	1														
OK-279/A	Voltage Controller Grp			1	1														
PU-544/A	Inverter	1	2	1	1														
PU-545/A	Inverter	2	1	1	1														
PU-750/A	Inverter			1	1														
R-844/ARN-58	MB/GS Set	1	1	1	1														
R-1963/ARN	MB/GS Set	15 ₁	15 ₁	15 ₁	15 ₁														
RT-1167/ARC-164	UHF-AM Radio Set	16 ₁	16 ₁	16 ₁	16 ₁														
SA-521/A	Antenna Switch	1	1	1	1														
T-992/A	True Airspeed Xmtr	1	1	1	1														
TS-1843/APX	IFF Test Set	1	1	1	1														
TSEC/KY-28	Comm Security Set	CPO	CPO	CPO	CPO														
TSEC/KY-58	Comm Security Set	17 CPO	17 CPO	17 CPO	17 CPO														
134AV25518-1	ADF Sense Antenna	1	1	1	1														
134AV35003-1	GS Antenna	1	7 ₁																

2-2. Avionics and Surveillance Equipment Configurations (Cont):

OV-1		OV-1B	OV-1C	OV-1D	RV-1D							
TYPE NUMBER	FUNCTION/NOUN	OV-1B	OV-1C	OV-1D	RV-1D							
134AV45511-5	HF Antenna	1	1	1	1							
134CS30103-1	VOR Antenna	1	1	1	1							
134SCAV247-1	FM Comm Antenna			2	1							

2-2. Avionics and Surveillance Equipment Configurations (Cont).

NOTES:

1. Proposed retrofit installation.
2. Installed in selected aircraft only.
3. AN/APN-22 installed thru FY 67 aircraft. AN/APN-171 installed in FY 68 aircraft.
4. Either the AN/AAS-24 or the AN/APS-94D can be installed but not both. Equipment to be installed will be issued on a TOE basis only.
5. OV-1C aircraft prior to FY 66 and all OV-1B have the AN/ARN-30E and AN/ARN-59 installed. FY 66 and subsequent OV-1C aircraft have the AN/ARN-82 and AN/ARN-83 installed. The retrofit replacement of the AN/ARN-30E by the AN/ARN-82 in all applicable aircraft is proposed.
6. The AT-134 is modified to become 134AV25508-1.
7. The AT-326 (Collins 37P4) or the 134AV35003-1 is installed on OV-1C aircraft.
8. Either the DT-309 or DT-376 may be installed as a part of the DT-173.
9. The ID-250 is installed in lieu of the ID-663 in some OV-1B and OV-1C aircraft.
10. Provisions installed for 2 each KA-60C in addition to KS-113A system.
11. Installed in FY 66, FY 67 and FY 68 aircraft in addition to KS-61 or KS-104 () systems.
12. KS-61A installed thru FY 66 aircraft. KS-104A installed in FY 67 aircraft and KS-104B installed in FY 68 aircraft.
13. Some components of these systems are installed. However, the cameras and other major components are issued on a TOE basis only.
14. Equipment issued on a TOE basis.
15. Proposed retrofit replacement for R-844.
16. Proposed retrofit replacement for AN/ARC-51.
17. Proposed retrofit replacement for TSEC/KY-28.

APPLICABLE AIRCRAFT AVIONICS MANUALS:

TM 11-1510-204 Series (Pertains to OV-1B, C, D)
TM 11-1510-213 Series (Pertains to RV-1D)

2-2. Avionics and Surveillance Equipment Configurations (Cont.)

The following configuration depicts a typically configured T-41B. The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

T-41B

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont.)

APPLICABLE AIRCRAFT AVIONICS MANUALS:

DA Publications are not available.

2-2. Avionics and Surveillance Equipment Configurations (Cont.)

The following configuration depicts a typically configured T-42A. The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

T-42A

[illegible]

2.2. Avionics and Surveillance Equipment Configurations (Cont).

The following configuration depicts a typically configured U-8 (). The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

U-8

TYPE NUMBER	FUNCTION/NOUN	U-8D	U-8D (Modernized)	U-8F	U-8F (Modernized)	U-8G							
AM-3209/ASN	Servoamplifier		1		1	1							
AN/APN-158	Weather Radar			1	1								
AN/APX-72	IFF Transponder	1	1	1	1	1							
AN/ARA-54	Glide Slope Receiver	1	1	1	1	1							
AN/ARC-44	VHF-FM Radio Set	1		1		1							
AN/ARC-51BX	UHF-AM Radio Set		1		1								
AN/ARC-54/131	VHF-FM Radio Set		1		1								
AN/ARC-55	UHF-AM Radio Set	1		1		1							
AN/ARC-73	VHF-AM Radio Set	1		1		1							
AN/ARC-102	HF-AM Radio Set	CPO	CPO	CPO	CPO	CPO							
AN/ARC-134	VHF-AM Radio Set		1		1								
AN/ARN-12/32	MB Receiver	1	1	1	1								
AN/ARN-30	VOR Set	2 ₁	1 ₁	2 ₁	1 ₁	2 ₁							

2-2. Avionics and Surveillance Equipment Configurations (Cont).

U-8		U-8D	U-8D (Modernized)	U-8F	U-8F (Modernized)	U-8G							
TYPE NUMBER	FUNCTION/NOUN	U-8D	U-8D (Modernized)	U-8F	U-8F (Modernized)	U-8G							
AN/ARN-103	TACAN Set		CPO ¹		CPO ¹								
AN/ARN-59	ADF Set	2 ₁	1 ₁	2 ₁	1 ₁	2 ₁							
AN/ASN-13	Gyro Compass Set	1	1	1	1	1							
AS-1703/AR	FM Comm Antenna		1		1								
AT-454/ARC	FM Comm Antenna	1		1		1							
AT-884/APX	IFF/TACAN Antenna		1		1								
AT-1108/ARC	VHF-AM/UHF Antenna	1	1	1	1	1							
BB-432/A	Battery			1	1								
C-1611/AIC	Intercomm Set		2		2								
C-8157/ARC	Control Indicator		CPO		CPO								
CU-942/ARC	FM Antenna Coupler		1		1								
CU-991/ARC	HF Antenna Coupler	CPO		CPO		CPO							
CU-1658/A	HF Antenna Coupler		CPO		CPO								
CV-1275/ARN	Converter		1		1								
ID-250/ARN	RMI		3 ₁		3 ₁								
ID-387/ARN	Course Indicator		3CPO		3CPO								
ID-663/A	BDH Indicator		3CPO		3CPO								
ID-998/A	RMI		1		1								

2.2. Avionics and Surveillance Equipment Configurations (Cont).

U-8		U-8D	U-8D (Modernized)	U-8F	U-8F (Modernized)	U-8G							
TYPE NUMBER	FUNCTION/NOUN	U-8D	U-8D (Modernized)	U-8F	U-8F (Modernized)	U-8G							
KIT-1A/TSEC	IFF Computer	CPO	CPO	CPO	CPO	CPO							
MD-736/AR	Signal Discriminator		2		2								
MT-1719/AR	Mount (CU-991)	CPO		CPO		CPO							
MT-3513/APX	Mount (TS-1843)	1	1	1	1	1							
MT-3772/A	Mount (CU-1658)		CPO		CPO								
MT-3802/ARC	Mount (KY-28)		CPO		CPO								
MT-3949A/U	Mount (KIT-1A)	1	1	1	1	1							
MX-1646/AIC	Headset Adapter	2		2		2							
PU-543/A	Inverter			1		2							
PU-544/A	Inverter		2	1	2								
R-33	Battery	2	2			2							
R-1041/ARN	MB Receiver					1							
SB-329	Signal Dist Panel	2		2		2							
T-366/ARC	VHF-AM Transmitter	1		1		1							
TS-1843/APX	IFF Test Set	1	1	1	1	1							
TSEC/KY-28	Comm Security Set		CPO		CPO								
1-100A	Inverter	2											
1-101A	Inverter	1											

2-2. Avionics and Surveillance Equipment Configurations (Cont).

NOTES:

1. Either 1 ea ADF, 1 ea VOR and 1 ea TACAN or 2 ea ADF and 1 ea VOR or 2 ea VOR and 1 ea ADF may be installed.
2. Either 2 ea ADF and 1 ea VOR or 1 ea ADF and 2 ea VOR may be installed.
3. The ID-387 and ID-663 are installed in lieu of the ID-250 with the TACAN, VOR and ADF configuraton.

GENERAL NOTE: The modernized configuration pertains to those aircraft which have had Avionics Standardization MWOs (ZYP/ZYU) applied.

APPLICABLE AIRCRAFT AVIONICS MANUALS:
TM 11-1510-201 Series

2-2. Avionics and Surveillance Equipment Configurations (Cont).

The following configuration depicts a typically configured U-10A. The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

U-10A

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).

NOTES:

*Commercial equivalent may be installed.

APPLICABLE AIRCRAFT AVIONICS MANUALS:

DA Publications are not available.

2.2. Avionics and Surveillance Equipment Configurations (Cont).

The following configuration depicts a typically configured U-21() /RU-21 (). The actual configuration may vary depending on peculiar geographic requirements or changes incorporated through MWO action and special purpose alterations.

These configurations do not include mission equipment installed in the RU-21 series aircraft.

U-21 & RU-21

TYPE NUMBER	FUNCTION/NOUN	U-21A/G	RU-21A	RU-21B	RU-21C	RU-21D	RU-21H	U-21F					
AM-3209/ASN	Servoamplifier	1	1	1	1	1	1						
AN/ALR-46	Radar Warning System						1						
AN/APN-158	Weather Radar	1	1	1	1	1	1						
AN/APR-25/26	Radar Warning Receivers					CPO							
AN/APX-72	IFF Transponder	1	1	1	1	1	1						
AN/ARA-50	UHF DF Set		CPO	CPO	CPO								
AN/ARC-51BX	UHF-AM Radio Set	1	1	1	1	1							
AN/ARC-54/131	VHF-FM Radio Set	1	1	1	1	1	1						
AN/ARC-102	HF-AM Radio Set	¹ 1	¹ 1	¹ 1	¹ CPO	¹ 1	¹ 1						
AN/ARC-134	VHF-AM Radio Set	1	1	1	1	1	1						
AN/ARN-82	VOR Set	1	1	1	1	1	1						
AN/ARN-83	ADF Set	1	1	1	1	1	1						

2-2. Avionics and Surveillance Equipment Configurations (Cont).

U-21 & RU-21		U-21A/G	RU-21A	RU-21B	RU-21C	RU-21D	RU-21H	U-21F					
TYPE NUMBER	FUNCTION/NOUN												
	Left blank intentionally												
AN/ARN-103	TACAN Set	2 ₁	1	1	1	1	1						
AN/ASN-43	Gyro Compass Set	1	1			1	1						
AN/ASN-86	Inertial Nav System		1	1	1	1	1						
AS-580/ARN	VOR/GS Antenna	1				1	1						
AS-1703/AR	FM Comm Antenna	1											
AS-1922/ARC	FM Homing Antenna	1	1	1	1	1	1						
AS-2285/ARC	FM Comm Antenna		1	1	1	1	1						
AT-640/ARN	MB Antenna												
AT-884/APX	IFF/TACAN Antenna	2	3	3	3	2	2						
AT-1108/ARC	VHF-AM/UHF Antenna	1	1	1	1	1	1						
BB-433/A	Battery	1	1				1						
C-1611/AIC	Intercomm Set	3	2	2	2	2	2						
C-8157/ARC	Control-Indicator	1	1	1	1	1	1						
CN-405/ASN	Flux Compensator		1	1	1	1	1						
CU-942/ARC	FM Antenna Coupler	1											
CU-1658/A	HF Antenna Coupler	1	1	1	CPO	1	1						
ID-250/ARN	RMI	1				1	2						

2-2. Avionics and Surveillance Equipment Configurations (Cont).

U-21 & RU-21		U-21A/G	RU-21A	RU-21B	RU-21C	RU-21D	RU-21H	U-21F					
TYPE NUMBER	FUNCTION/NOUN												
ID-351/387	Course Indicator	1	1	1	1	1	1						
ID-998/ASN	RM1	1	1			1	1						
K1T-1A/TSEC	IFF Computer	CPO	CPO	CPO	CPO	CPO	CPO						
MC-1	Rate Switching Gyro	2				1	1						
MD-1	Displacement Gyro	2				1	1						
MD-736/A	Signal Discriminator	3	2	2	2	2	2						
MT-3513/APX	Mount (TS-1843)	1	1	1	1	1	1						
MT-3772/A	Mount (CU-1658)	1	1	1	CPO	1	1						
MT-3802/ARC	Mount (KY-28)	1	1	1	1	1	1						
MT-3949A/U	Mount (KIT-1A)	1	1	1	1	1	1						
PU-543/A	Inverter					1							
PU-544/A	Inverter						1						
R-844/ARN-58	MB/GS Receiver	1	1	1	1	1	1						
R-1963/ARN	MB/GS Receiver	3 ₁	3 ₁	3 ₁	3 ₁	3 ₁	3 ₁						
RT-1167/ARC-164	UHF-AM Radio Set	4 ₁	4 ₁	4 ₁	4 ₁	4 ₁	1						
T-611/ASN	Compass Transmitter		1	1	1	1	1						
T-992/A	True Airspeed Transmitter					1	1						
TS-1843/APX	IFF Test Set	1	1	1	1	1	1						

2.2. Avionics and Surveillance Equipment Configurations (Cont).

U-21 & RU-21														
TYPE NUMBER	FUNCTION/NOUN	U-21A/G	RU-21A	RU-21B	RU-21C	RU-21D	RU-21H	U-21F						
TSEC/KY-28	Comm Security Set	CPO	CPO	CPO	CPO	CPO	CPO							
TSEC/KY-58	Comm Security Set	⁵ CPO	⁵ CPO	⁵ CPO	⁵ CPO	⁵ CPO	⁵ CPO							
071-1034-00 (King)	ADF Loop Antenna							1						
1014A (Wilcox)	Transponder							1						
35-5003 (CCC)	VHF Antenna							1						
35-5016 (CCC)	MB Antenna							1						
35-5017 (CCC)	VOR/GS Antenna							1						
35-5018 (CCC)	DME/Transponder Antennas							2						
50-345611 (Beech)	ADF Sense Antenna	⁶ ₁												
50-345615 (Beech)	HF Antenna		1	1	CPO		1							
50-345764-1 (Beech)	Main Inverter	⁶ , ⁷ ₁	⁷ ₁	⁷ ₁	⁷ ₁	⁷ ₁	⁷ ₁							
50-345764-2 (Beech)	Standby Inverter	⁶ , ⁷ ₁	⁷ ₁	⁷ ₁	⁷ ₁	⁷ ₁	⁷ ₁							
50-345764-5 (Beech)	Main Inverter	⁷ , ⁸ ₁												
50-345764-6 (Beech)	Standby Inverter	⁷ , ⁸ ₁												
50-345772 (Beech)	Mount (RT-698/ARC-102)	¹ ₁	¹ ₁	¹ ₁	¹ CPO	¹ ₁	¹ ₁							
50-345812 (Beech)	ADF Sense Antenna	⁸ ₁	1	1	1	1	1							
50-345974 (Beech)	RMI			⁹ ₁	⁹ ₁									
50-346063-3 (Beech)	HF Antenna	⁶ ₁				1								

2-2. Avionics and Surveillance Equipment Configurations (Cont).

U-21 & RU-21		U-21A/G	RU-21A	RU-21B	RU-21C	RU-21D	RU-21H	U-21F				
TYPE NUMBER	FUNCTION/NOUN											
51RV-2B (Collins)	VOR/GS Set							2				
51Z-6 (Collins)	MB Set							1				
91-340045-1 (Beech)	HF Antenna	8 1										
331A-3G (Collins)	Course Indicator							1				
331A-6P (Collins)	Course Indicator							1				
356C-4 (Collins)	Isolation Amplifier							2				
356F-3 (Collins)	Speaker Amplifier							2				
618M-2B (Collins)	VHF-AM Radio Set							2				
AP-105 (Collins)	Autopilot							1				
AVQ-55 (RCA)	Weather Radar							1				
C-14-3 (Sperry)	Compass System							1				
CA-5H (Marathon)	Battery							1				
D11220-1	Battery					1						
DME-40 (Collins)	DME Set							1				
E551-11220-6	Battery			1	1							
FD-108N (Collins)	Flight Director							1				
H-14 (Honeywell)	Autopilot		1	1	1							
KDF-800 (King)	ADF Set							1				

2-2. Avionics and Surveillance Equipment Configurations (Cont).

U-21 & RU-21		U-21A/G	RU-21A	RU-21B	RU-21D	RU-21H	U-21F						
TYPE NUMBER	FUNCTION/NOUN												
KF-580 (King)	ADF Control						1						
MGH-182-100 (Leland)	Inverter						2						
MGH-229-100 (Leland)	Inverter		1	1	1								
PN-101 (Collins)	Compass System						1						
VC-150W (Gables)	Transponder Control						1						
VC-270D-PS (Gables)	VHF Control						2						
VC-270D-XX (Gables)	VHF Control						1						
VT-10-02	VOR/GS Antenna		2	2	2								

2-2. Avionics and Surveillance Equipment Configurations (Cont).

[illegible]

2-2. Avionics and Surveillance Equipment Configurations (Cont).

NOTES:

1. Utilizes a 50-345772 mount which is made from a PP-3702.
2. AN/ARN-52 may be installed in some aircraft.
3. Proposed retrofit replacement for R-844.
4. Proposed retrofit replacement for AN/ARC-51.
5. Proposed retrofit replacement for KY-28.
6. Installed in U-21A only.
7. Made from PU-545/A.
8. Installed in U-21G only.
9. Made from ID-998/ASN.

GENERAL NOTE: The U-21F avionics configuration contains all commercial equipment. As such, data sheets for these items will not appear in this publication. Information pertaining to the support of these items is contained in AVSCOM Pamphlet 700-1.

APPLICABLE AIRCRAFT AVIONICS MANUALS:

TM 11-1510-209 Series
TM 11-5825-252 Series (RU-21D Mission Equipment)
TM 11-5865-216 Series (RU-21H Mission Equipment)
TM 11-5895-809 Series (RU-21D Mission Equipment)

2-3. Aircraft Armament.

The following aircraft armament subsystems and related components are either in the Research and Development stage, or have been type classified for field usage.

2-4. Aircraft Armament Application.

ARMT SS	AIRCRAFT APPLICATION																
	UH-1					AH-1				OH-6A	OH-58		CH-47				YAH-64
	B	C	M	D	H	G	S*	S#	S##		A	C	A	B	C	D	A
M5	X	X	X														
M18A1						X	X	X	X								
M21	X	X	X														
M23					X	X											
M24													X				
M27										X	X						
M28A1						X											
M28A2							X										
M35						X											
M41													X	X	X		
M156	X	X	X														
M28A3							X	X									
XM97E1								X	X								
M19	X	X		X	X												
M59				X	X												
M128							X										
M56				X	X												
XM139																X	
M136								X	X								

Source (DRSAR-MAG)

Aircraft Armament Application (cont)

ARMT SS	AIRCRAFT APPLICATION									
	UH-1					AH-1				YAH-64
	B	C	M	D	H	G	S*	S#	S##	A
M65							X	X	X	
M22	X	X								
M158A1	X	X	X			X	X	X	X	
M200A1	X	X	X			X	X	X	X	
XM260										X
XM135								X	X	
XM261										X
XM 227							X	X	X	
HMMS										X

*AH-1S (MOD) from AH-1G models

#AH-1S new production

AH-1S modernized from AH-1S (MOD)

Source: (DRSMI-D)

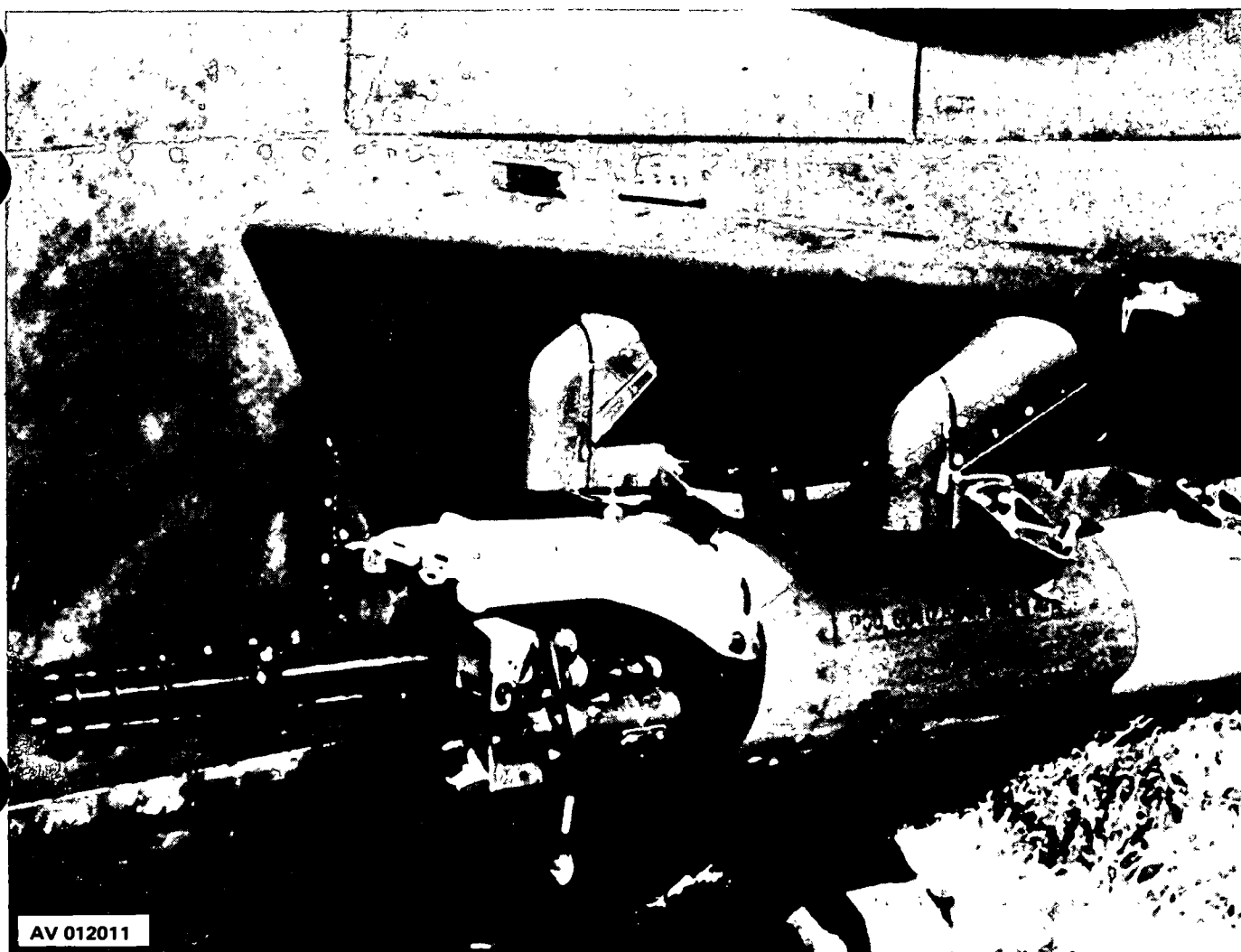


Figure 2-1. M18A1 Armament subsystem

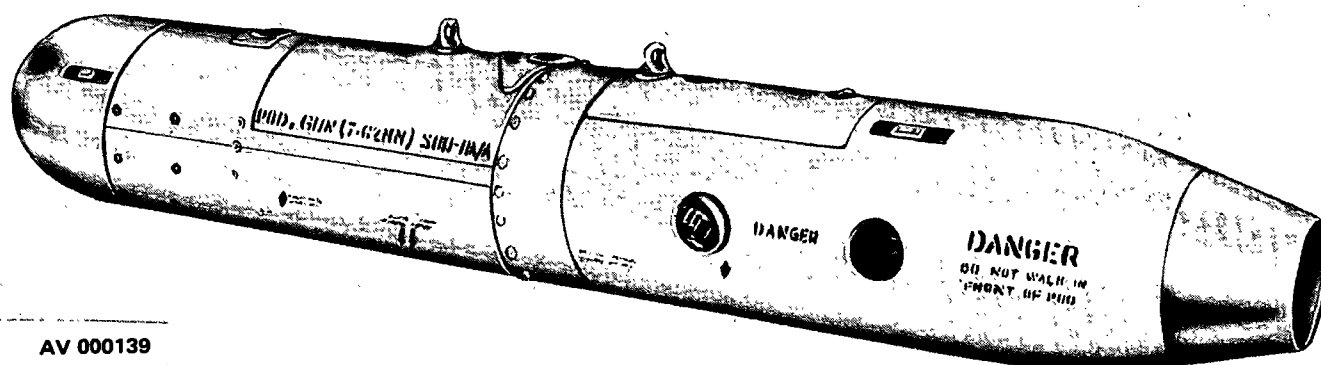


Figure 2-2. M18A1 Armament subsystem

2-5. M18A1 Armament Subsystem.

ARMAMENT SUBSYSTEM: M18A1
APPLICABLE AIRCRAFT TYPE MODEL AND SERIES: Attack helicopter AH-1 SERIES
AVERAGE PROCUREMENT PRICE: \$20,070
TYPE CLASSIFICATION: Standard
LOGISTIC CONTROL CODE: A

NOMENCLATURE: Armament pod, helicopter, 7.62mm machine gun: high-rate

DESCRIPTION: The M18A1 armament pod consists of one 7.62mm automatic gun, M134, in a cylindrical pod mounted on the inboard wing stores of the aircraft. The pod stores 1500 rounds of ammunition in a linkless feed system. The gun is electrically driven at either low rate, 2000 shots per minute, or high rate, 4000 shots per minute. The pod is self-powered by a self contained battery with a power start feature using auxiliary aircraft power for more starting torque. The pod is rigidly mounted and aiming is accomplished by maneuvering the aircraft.

CHARACTERISTICS:

MAXIMUM EFFECTIVE RANGE:	1500 meters
ELEVATION:	Fixed
MUZZLE VELOCITY:	2750 FPS
RATE OF FIRE:	2000 or 4000 SPM
TRAVERSE:	Fixed
EMPTY WT: 240 lbs	LOADED WT: 320 lbs
AMMUNITION:	
TYPE:	Linked 7.62mm
CAPACITY:	1500 rds
SIGHTING:	M73 Reflex type

MAINTENANCE AND SUPPLY:

Maintenance instruction:	AVUM TM 9-1005-257-12	AVIM and Depot Support TM 9-1005-257-35
Repair parts:	TM 9-1005-257-20P	35P
Special tools	TM 9-1005-257-20P	35 and 35P
Shop sets:	Not Applicable	

MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:

<u>KIT</u>	<u>NSN</u>	<u>PUBLICATION</u>	<u>NICP</u>	<u>FUND REQUIREMENTS</u>
-	1005-00-832-7498	TM 9-1005-257-12	B14	DA controlled

Operational instructions for subsystem can be found in TM 55-1520-221-10.

2-6. M28A2 Armament Subsystem.

ARMAMENT SUBSYSTEM: M28A2
 APPLICABLE AIRCRAFT – TYPE, MODEL, SERIES: AH-1Q
 AVERAGE PROCUREMENT PRICE: \$183,567
 TYPE CLASSIFICATION: Standard

NOMENCLATURE: Armament subsystem, helicopter, 7.62mm machine gun, 40mm grenade launcher.

DESCRIPTION: The M28A2 armament subsystem is an electrically controlled, hydraulically operated, dual weapon that provides wide angle coverage and rapid fire for the AH-1Q TOW/Cobra. The M28A2 armament subsystem consists of a power operated chin turret, mounting the 7.62mm machine gun M134 and on the right and the 40mm grenade launcher M129 on the left. Ammunition is stored in the ammunition bay and moved to the turret through fixed and flexible chuting. The M28A2 is controlled in the flexible mode by either the gunner or pilot by use of the M128 helmet sight subsystem. The gunner can also direct fire by using the telescopic sight unit. The M-73 sight gives the pilot the ability to fire the turret weapons in the stowed position. The system provides the AH-1Q TOW/cobra with area and point fire for attack on personnel and lightly armored and unarmored materiel targets during escort and armed reconnaissance missions.

CHARACTERISTICS:

MAXIMUM EFFECTIVE RANGE: 7.62mm 1500 meters; 40mm 1500 meters
ELEVATION/DEPRESSION: +20° – 50° variable with traverse
MUZZLE VELOCITY: Machine gun 2750 FPS 40mm Grenade launcher 790 FPS
RATE OF FIRE: 7.62mm - 2000 or 4000 SPM, 40mm - 420 SPM
TRAVERSE: 110° left and right of longitudinal axis of AH-1G
EMPTY WT: 7.62mm and 40mm 447 lbs **LOADED WT:** 897 lbs

AMMUNITION:
CAPACITY: Maximum 4000 rds for each M 134, 300 rds for each M129.

TYPE: Linked 7.62mm and 40mm.
SIGHTING: M128 helmet sight subsystem
 M73 reflex sight
 M65TOW missile subsystem

2-6. M28A2 - Armament Subsystem (Cont).

MAINTENANCE AND SUPPLY:

Maintenance	AVUM	AVLM and Depot
Instruction:	TM 9-1090-203-12-1	-34-1 AH-1Q Supplements
Repair parts:	TM 9-1090-203-20P-1	-34-1 AH-1Q Supplements
Special tools:	TM 9-1090-203-12-1 and 20P-1	
Shop sets:	Not Applicable	Not Applicable

MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:

<u>KIT</u>	<u>NSN</u>	<u>PUBLICATION</u>	<u>NICP</u>	<u>FUND REQUIREMENTS</u>
-	1090-00-081-1046	TM 9-1090-203-12-1	B14	DA Controlled

Operation instructions are contained in TM 55-1520-221-10-1.

2-7. M28A1 Armament Subsystem.

ARMAMENT SUBSYSTEM: M28A1
 APPLICABLE AIRCRAFT – TYPE, MODEL, SERIES: AH-1G
 AVERAGE PROCUREMENT PRICE: \$95,067
 TYPE CLASSIFICATION: Standard
 LOGISTIC CONTROL CODE: A

NOMENCLATURE: Armament subsystem, helicopter, 7.62mm machine gun, 40mm grenade launcher.

DESCRIPTION: The M28A1 armament subsystem is an electrically controlled, hydraulically operated, dual weapon that provides wide angle coverage and rapid fire for the AH-1G Hueycobra. The M28A1 armament subsystem consists of a power operated chin turret, mounting the 7.62 mm machine gun M134 on the right and the 40mm grenade launcher M129, on the left. Ammunition is stored in the ammunition bay and moved to the turret through fixed and flexible chuting. Fire control equipment is located at the gunner/co-pilot station and allows the gunner to train the weapons in azimuth and elevation. Provisions are made for the pilot to fire the weapons in the stow position. The system provides the AH-1G Hueycobra with area and point fire for attack on personnel and lightly armored and unarmored materiel targets during escort and armed reconnaissance missions.

CHARACTERISTICS:

MAXIMUM EFFECTIVE RANGE: 7.62mm 1500 meters; 40mm 1500 meters
 ELEVATION/DEPRESSION: Variable elevator traverse, +12° to +17.5° and depression –50°.
 MUZZLE VELOCITY: Machine gun 2750 FPS 40mm Grenade launcher 790 FPS
 RATE OF FIRE: 7.62mm - 2000 or 4000 SPM, 40mm - 420 SPM
 TRAVERSE: 114° left and right of longitudinal axis of AH-1G
 EMPTY WT: 7.62mm and 40mm 447 lbs LOADED WT: 897 lbs
 AMMUNITION:
 CAPACITY: Maximum 4000 rds for M134, 300 rds for M129.
 TYPE: Linked 7.62mm and 40mm.
 SIGHTING: Pilots reflex sight M73, lighted reticle and manual range adjustment.
 Gunner sight is a flexible reflex sight with automatic air speed compensation.

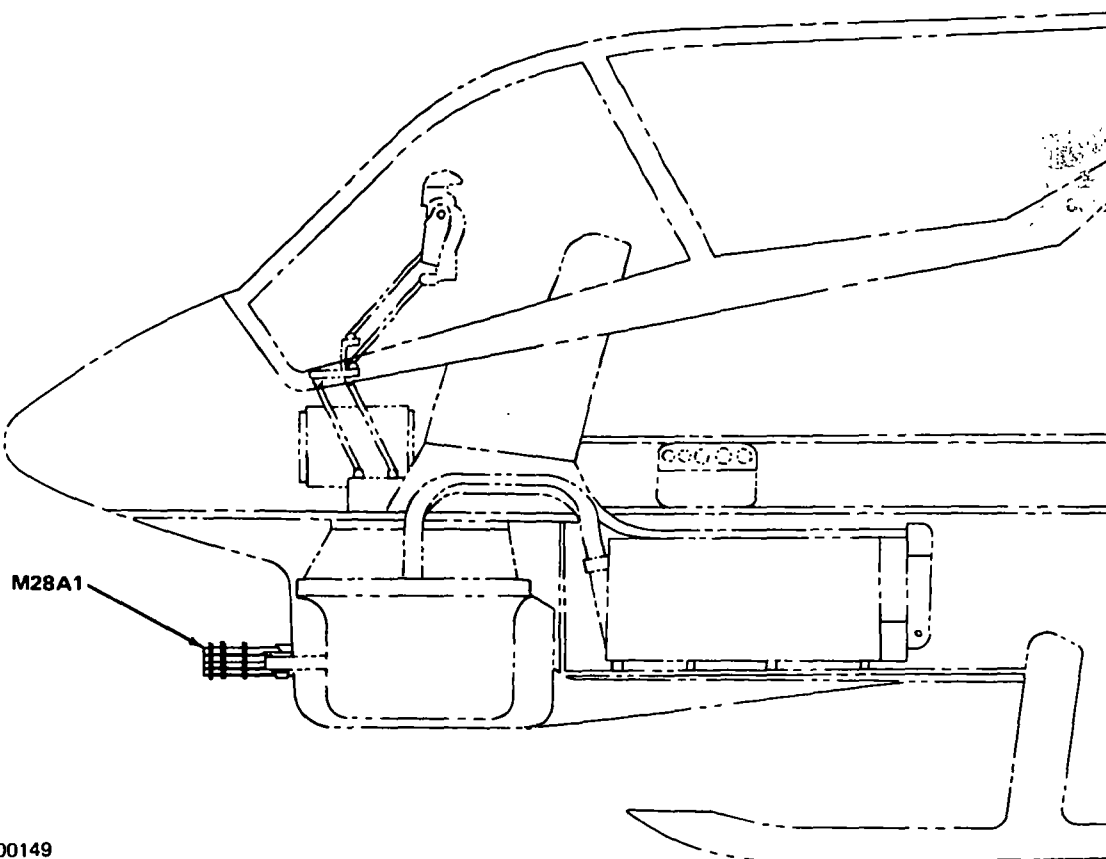
2-7. M28A1 Armament Subsystem (Cont).**MAINTENANCE AND SUPPLY:**

Maintenance	AVUM	Avim and Depot
Instruction:	TM 9-1090-203-12;	-34
Repair parts:	TM 9-1090-203-20P;	-34P
Special tools:	TM 9-1090-203-12 and 20P;	-34 and -34P
Shop sets:	Not Applicable	DMWR 9-1090-203

MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:

<u>KIT</u>	<u>NSN</u>	<u>PUBLICATION</u>	<u>NICP</u>	<u>FUND REQUIREMENTS</u>
—	1090-00-134-3071	TM 9-1090-203-12	B14	DA Controlled

Operation instructions are contained in TM 55-1520-221-10.



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Figure 2-3. M28A1 Armament subsystem

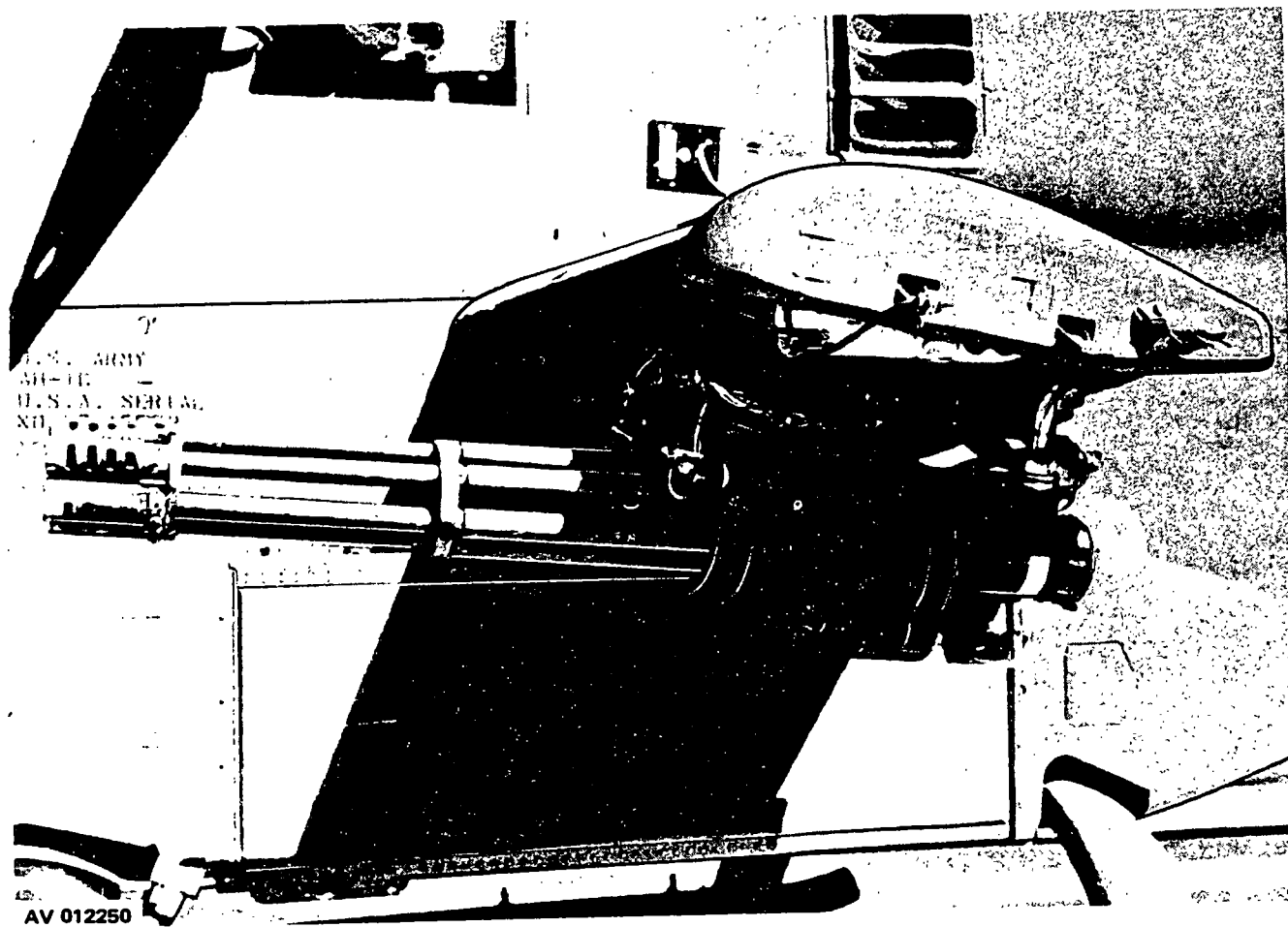


Figure 2-4. M35 Armament subsystem

2-8. M35 Armament Subsystem.

ARMAMENT SUBSYSTEM: M35
 APPLICABLE AIRCRAFT – TYPE, MODEL, SERIES: AH-1G
 AVERAGE PROCUREMENT PRICE: \$44,865
 TYPE CLASSIFICATION: Standard
 LOGISTIC CONTROL CODE: B

NOMENCLATURE: Armament subsystem helicopter, M35

DESCRIPTION: The M35 Subsystem has a 20mm Gatling type gun mounted on the inboard station of the left hand wing. The gun is basically a modified M61A1 gun with shorter barrels and a declutching feeder. It is designated the 20mm automatic gun, M195. It automatically clears itself of all live rounds at the end of each burst without dumping live rounds overboard. The gun is a fixed mount and is pilot controlled. Controls are provided for the co-pilot/gunner to fire the weapon, if necessary. Two ammunition cans (one on either side) are faired into the fuselage at the base of the stub wings.

CHARACTERISTICS:

EFFECTIVE RANGE:	3000 meters
ELEVATION:	Attitude of aircraft
MUZZLE VELOCITY:	3380 FPS
RATE OF FIRE:	650-850 SPM
TRAVERSE:	Attitude of aircraft
EMPTY WT:	555 lbs (approx)
LOADED WT:	1187 lbs (approx)
AMMUNITION:	
CAPACITY:	950 rds
TYPE:	Linked 20mm – M56 HEI and XM220 TPT
SIGHTING:	M73 reflex type

MAINTENANCE AND SUPPLY:

	Maintenance	Organizational	Direct, General, and Depot Support
Instruction:		TM 9-1005-299-12	TM 9-1005-299-34
Repair parts:		TM 9-1005-299-20P	-35P*
Special tools:		TM 9-1005-299-20P	-34 and -35P*
Shop sets:		Not Applicable	

MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:

<u>KIT</u>	<u>NSN</u>	<u>PUBLICATION</u>	<u>NICP</u>	<u>FUND REQUIREMENT</u>
A	1560-00-246-4744	MWO 55-1520-221-40/4	B17	COBRA Project
C	1005-00-133-8193	TM 9-1005-299-12	B14	Manager (DRCPM-CO)

Operational instructions are contained in TM 55-1520-221-10.

*To be published as a -34P

2-9. XM40 Remote Fuze Setter Subsystem, Helicopter, 2.75 Inch Rocket Launcher.

Not applicable.

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Figure 2-5. XM40 Remote Fuze Setter Components

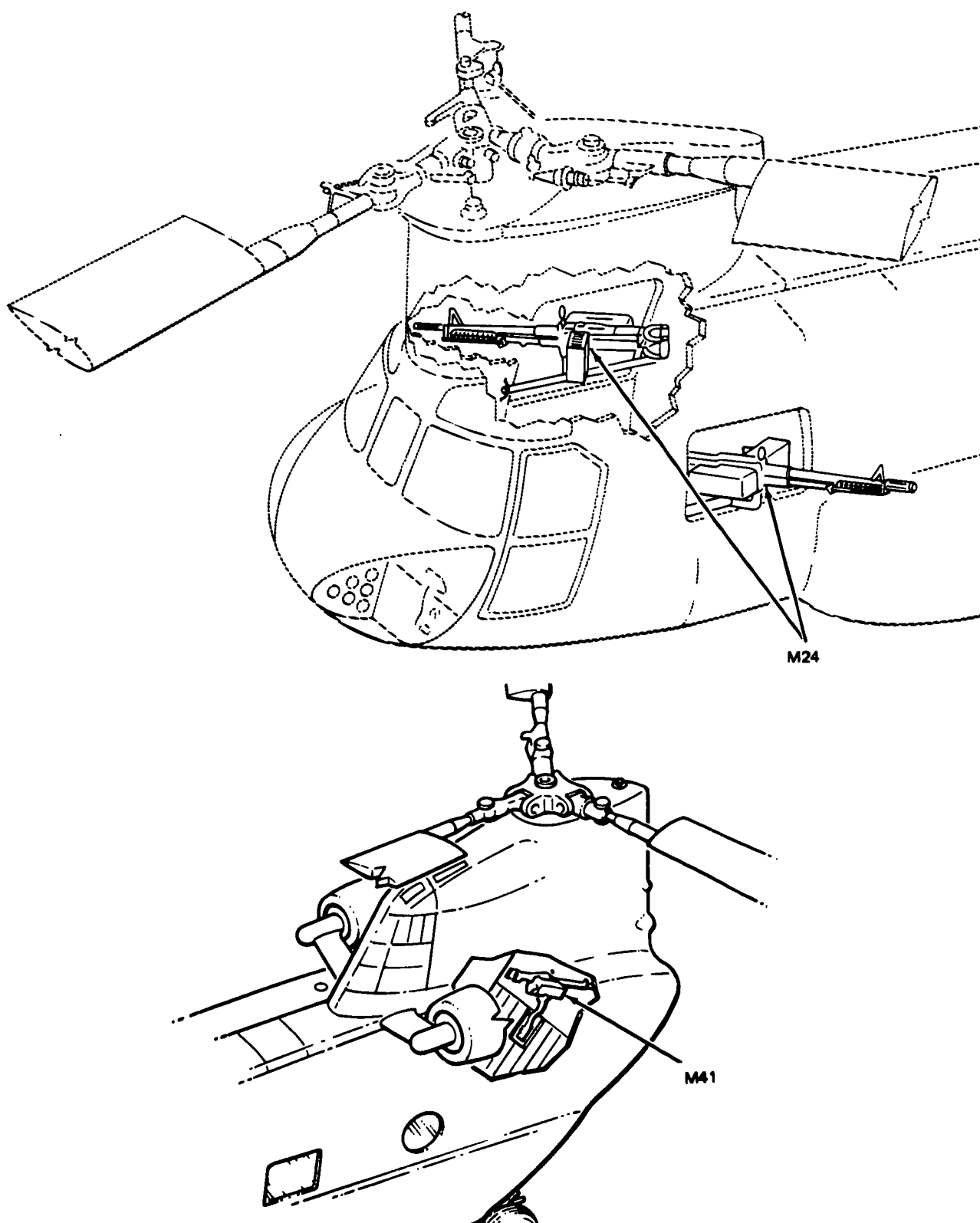


Figure 2-6. M-24 and M-41 Armament subsystems installed on CH-47 (Chinook) helicopter

2-10. M24 Armament Subsystem.

ARMAMENT SUBSYSTEM: M24
 APPLICABLE AIRCRAFT – TYPE, MODEL, SERIES: CH-47A
 AVERAGE PROCUREMENT PRICE: \$3722
 TYPE CLASSIFICATION: Standard
 LOGISTIC CONTROL CODE: A

NOMENCLATURE: Armament subsystem, helicopter, door pintle mounted 7.62mm M60D machine gun

DESCRIPTION: The subsystem consists of two machine guns, M60D, and two mounts, one mount on each side of the aircraft. The subsystem mount assemblies are located in the cabin doorway and forward escape hatch of the CH-47 type helicopter. The subsystem contains mechanical safeties and stops to preclude accidental damage to the aircraft due to inadvertent firing of the guns into the airframe. The mount assemblies are designed so that the left and right cams and stops cannot be installed and used incorrectly on the opposite side of the aircraft. The machine gun with bipod has the capability of being quickly removed from the mount and used as a ground weapon. A link and brass ejection control bag is attached to the right side of each machine gun to prevent the cartridge cases and links from being ejected into the paths of the rotor blades or turbine engine intake.

CHARACTERISTICS:

MAXIMUM EFFECTIVE RANGE:		1100 meters
ELEVATION:	Forward +3°, Aft +6.5°, Depression 78° right side, 67° left side	
MUZZLE VELOCITY:	2750 FPS	
RATE OF FIRE:	550 SPM	
TRAVERSE:	Left gun 71° fwd, 59° aft; right gun 74° fwd, 61° aft	
EMPTY WT:	97 lbs	LOADED WT: 123 lbs
AMMUNITION:		
CAPACITY:	200 rds per side	
TYPE:	Linked 7.62mm	
SIGHTING:	Ring and post type	

MAINTENANCE AND SUPPLY:

Maintenance	AVUM	AVIM and Depot
Instructions	TM 9-1005-262-14	
Repair parts:	TM 9-1005-262-24P	
Special tools:	TM 9-1005-262-24P	
Shop sets:	Not Applicable	

MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:

None required

<u>KIT</u>	<u>NSN</u>	<u>PUBLICATION</u>	<u>NICP</u>	<u>FUND REQUIREMENTS</u>
-	1005-00-763-1404	TM 9-1005-262-15	B14	DA Controlled

Operational instructions for subsystem can be found in TM 9-1005-262-15.

2-11. M41 Armament Subsystem.**ARMAMENT SUBSYSTEM:** M41**APPLICABLE AIRCRAFT – TYPE, MODEL, SERIES:** CH-47A/B/C**AVERAGE PROCUREMENT PRICE:** \$2,205**TYPE CLASSIFICATION:** Standard**LOGISTIC CONTROL CODE:** A

NOMENCLATURE: Armament subsystem, helicopter, 7.62mm machine gun M60D, ramp mounted, light weight.

DESCRIPTION: The M41 armament subsystem consists of a pintle mount, machine gun M60D, link and brass retainer, ammo box, and gunner's safety harness. The machine gun M60D, is utilized with positive mechanical stops to limit weapon attitude.

CHARACTERISTICS:

MAXIMUM EFFECTIVE RANGE: 1100 meters
ELEVATION/DEPRESSION: +12.5°, -69°
MUZZLE VELOCITY: 2750 FPS
RATE OF FIRE: 550 SPM cyclic rate
TRAVERSE: 52° right or left
WEIGHT: 41 lbs empty, 55 lbs loaded
AMMUNITION:
CAPACITY: 200 rds
TYPE: Linked 7.62mm
SIGHTING: Aircraft ring and post type

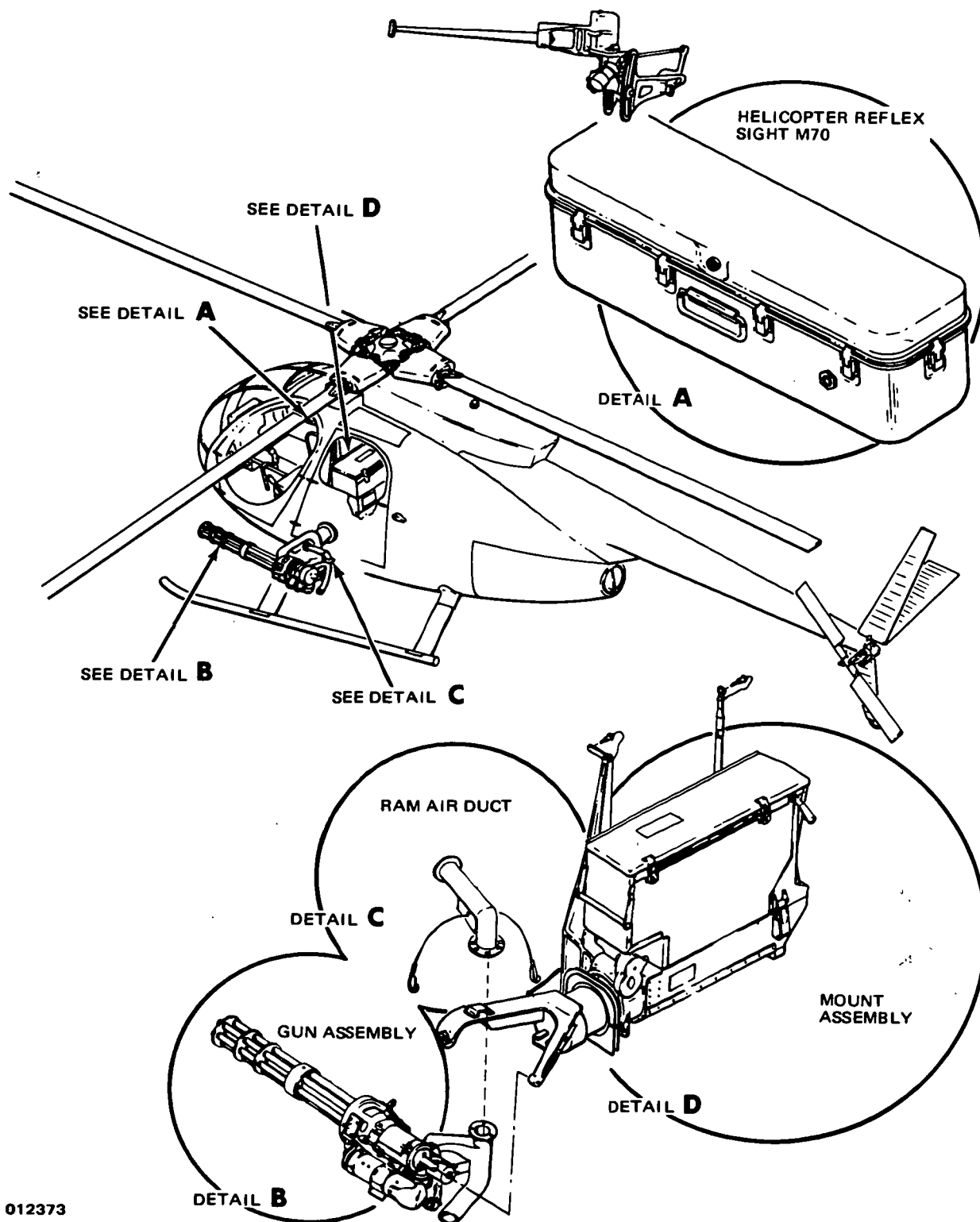
MAINTENANCE AND SUPPLY:

Maintenance	AVUM	AVUM
Instruction:	TM 9-1005-262-14	
Repair parts:	TM 9-1005-262-24P	
Special tools:	TM 9-1005-262-24P	
Shop sets:	Not Applicable	

MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:

<u>KIT</u>	<u>NSN</u>	<u>PUBLICATION</u>	<u>NICP</u>	<u>FUND REQUIREMENT</u>
C	1005-00-087-2046	TM 9-1005-262-24P	B14	DA Allocated

Operating instructions are contained in TM 9-1005-262-15.



AV 012373

Figure 2-7. M27 Armament system components (OH-6A application)

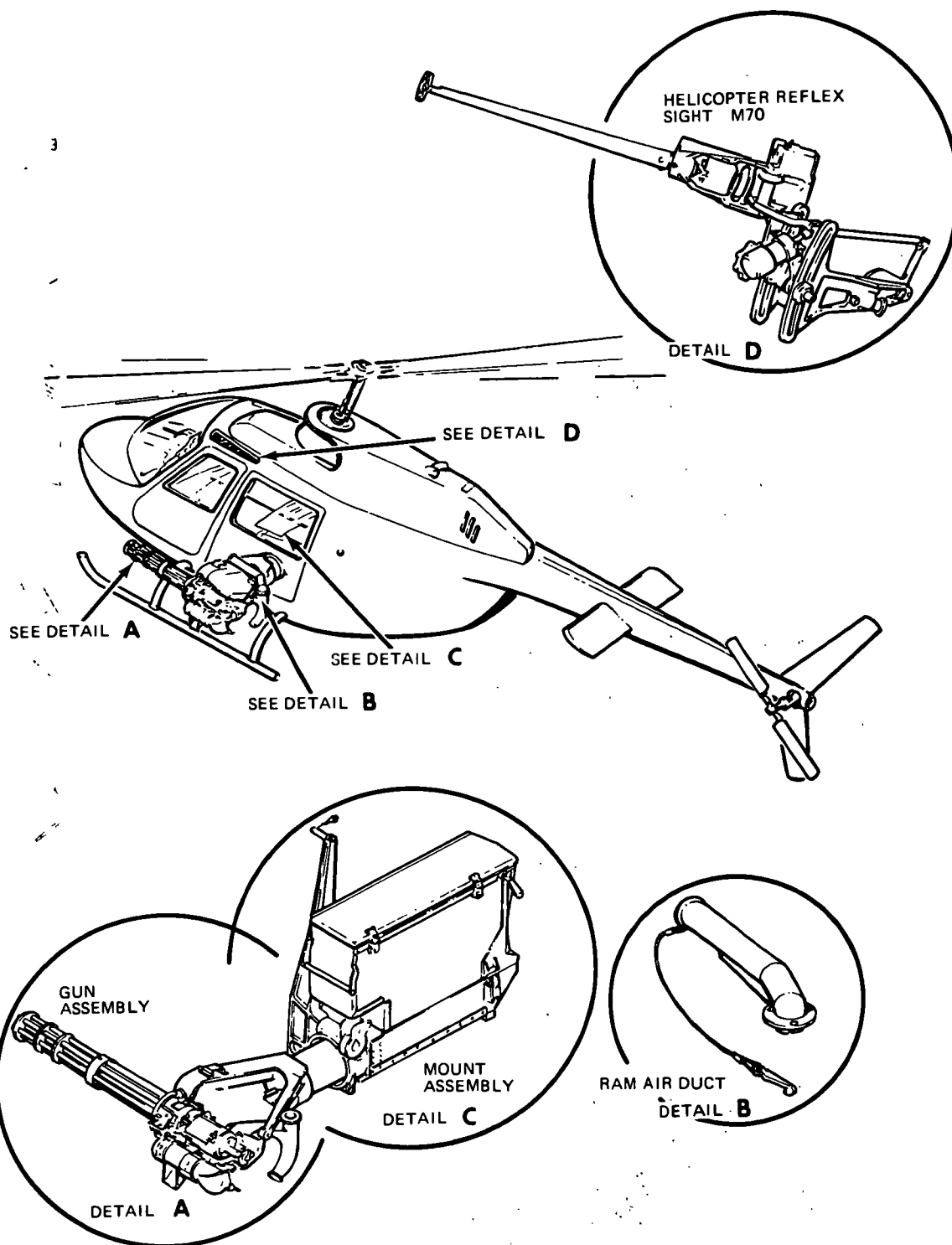


Figure 2-8. M27 (OH-58A application)

2-12. M27 Armament Subsystem.**ARMAMENT SUBSYSTEM: M27****APPLICABLE AIRCRAFT – TYPE, MODEL, SERIES: OH-6A, OH-58A****AVERAGE PROCUREMENT PRICE: \$25,439****TYPE CLASSIFICATION: Standard****LOGISTIC CONTROL CODE: B****NOMENCLATURE:** Armament subsystem, helicopter, 7.62mm machine gun; high rate M27

DESCRIPTION: The M27 armament subsystem mounts the high rate of fire 7.62mm machine gun M134. The subsystem consists of a single, remote controlled, semi-flexible mount which supports the machine gun, M134, on the left (port) side of the OH-6 and OH-58 helicopters. Linked 7.62mm ammunition is stored inboard and transported to the gun through fixed chuting. A flexible, mechanically linked sighting system enables the pilot to remotely aim and fire the machine gun. The weapon subsystem is flexible in elevation and depression only, being fixed in azimuth. The aircraft must be aimed by the pilot for target engagement. The armament subsystem is adaptable to the helicopter by means of quick release attachments. Complete internal provisions are incorporated in the production aircraft to accept the armament subsystem without modifications. The weapons subsystem complements weapon systems currently employed in the field.

CHARACTERISTICS:

MAXIMUM EFFECTIVE RANGE:	1500 meters
ELEVATION/DEPRESSION:	OH-6A +10°, to -24° OH-58A +5 1/2° to -20°
MUZZLE VELOCITY:	2750 FPS
RATE OF FIRE:	2000 or 4000 SPM
TRAVERSE:	None
EMPTY WT: 100 lbs	LOADED WT: 234 lbs
AMMUNITION:	
CAPACITY:	2000 rds.
TYPE:	Linked 7.62mm
SIGHTING:	Pilot M70 reflex type

MAINTENANCE AND SUPPLY:

Maintenance	AVUM	AVIM and Depot
Instruction:	TM 9-1005-298-12	-34
Repair parts:	TM 9-1005-298-20P	-35P
Special tools:	TM 9-1005-298-20P	-35P
Shop sets:	Not Applicable	DMWR 9-1005-298

MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:

KIT	NSN	PUBLICATION	NICP	FUND REQUIREMENT
C	1005-00-933-6242	TM 9-1005-298-12	B14	DA Allocated

2-13. UH-1B, C, and M Armament Configurations.

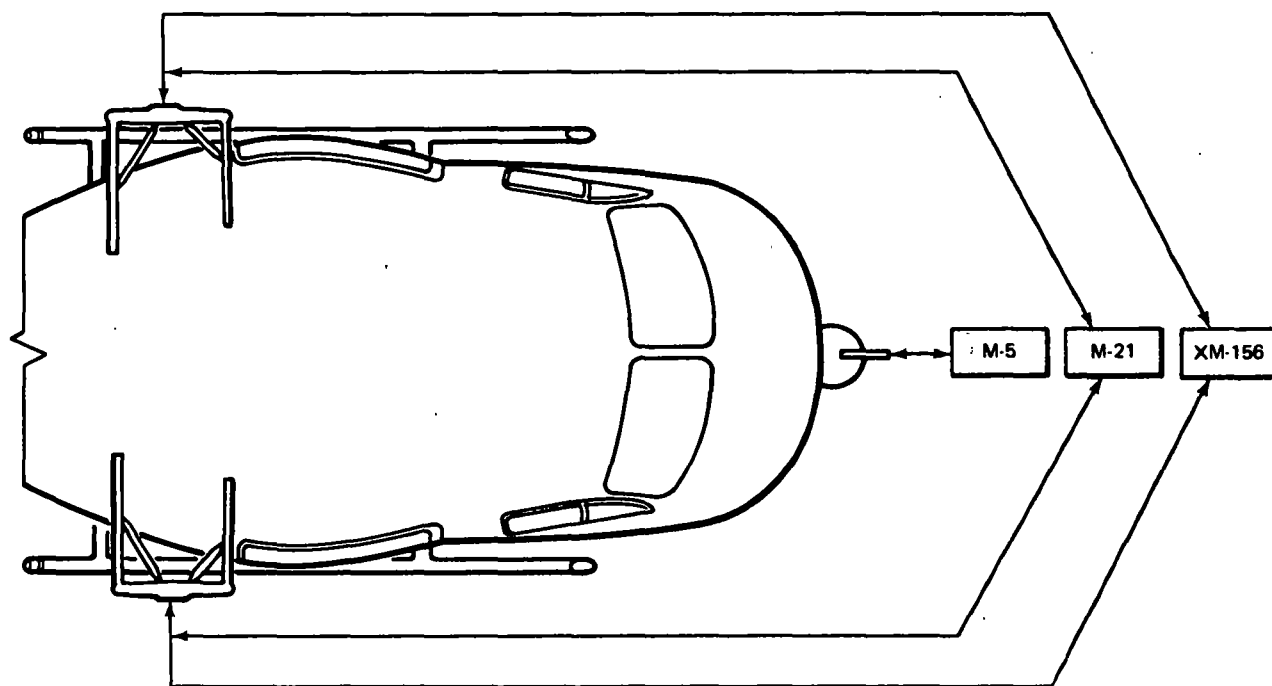


Figure 2-9. UH-1B, C, and M Armament configurations

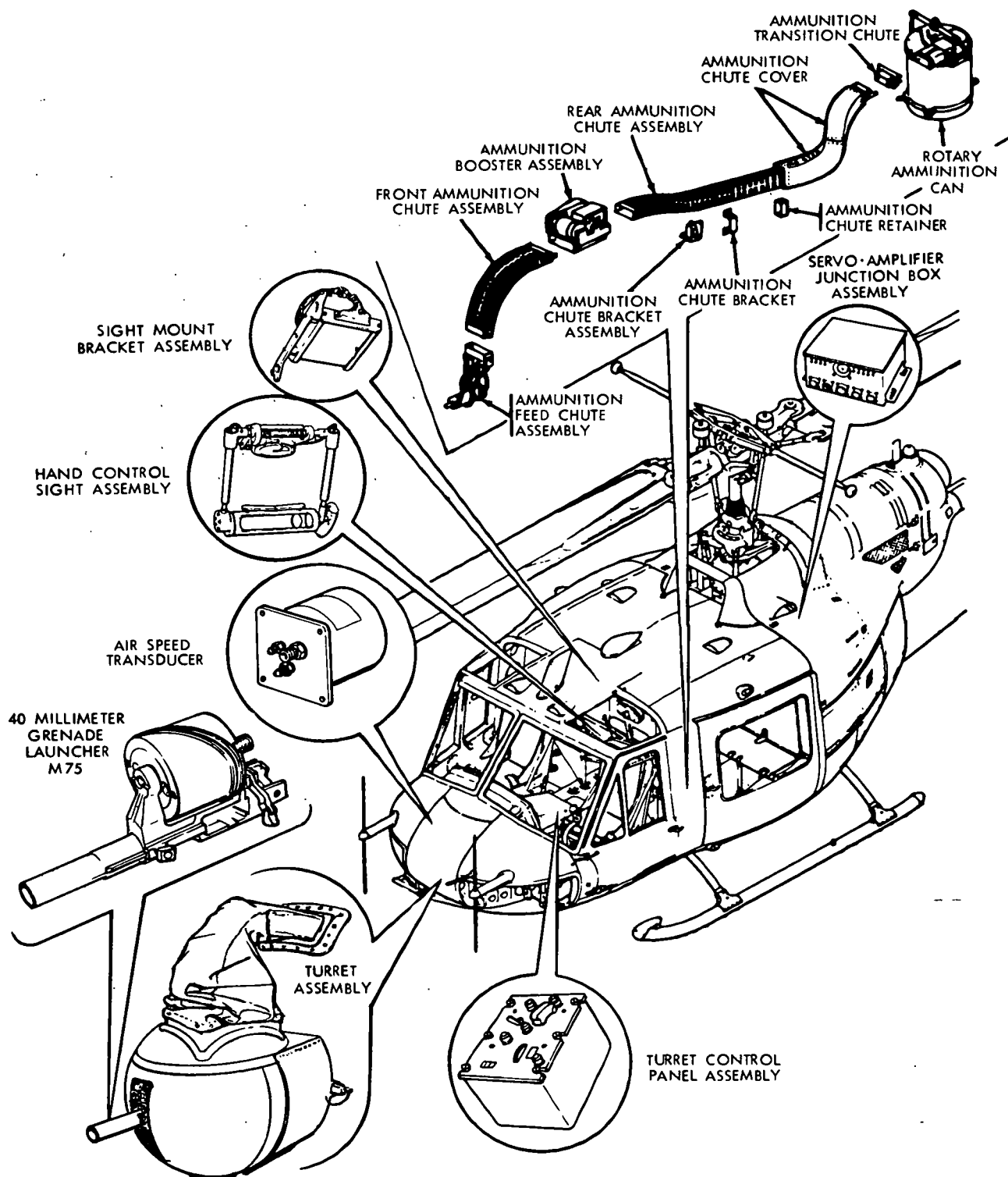


Figure 2-10. M5 Armament subsystem components on UH-1B/C/M (Iroquois) helicopter.

2-14. M5 Armament Subsystem, Grenade Launcher.

ARMAMENT SUBSYSTEM: M5

APPLICABLE AIRCRAFT – TYPE, MODEL, SERIES: Utility UH-1 B/C/M

AVERAGE PROCUREMENT PRICE: \$41,607

TYPE CLASSIFICATION: Standard

LOGISTIC CONTROL CODE: A

NOMENCLATURE: Armament subsystem, helicopter, 40 millimeter grenade launcher. Nose mounted turret (1 launcher). M75 Grenade Launcher, air cooled, electric motor driven.

DESCRIPTION: The M5 is used on the UH-1B/C/M helicopters, and consists of a flexible remote controlled, servo-power driven gun turret mounted in the nose of the UH-1B/C/M helicopters. The turret incorporates one M75 grenade launcher. Linked ammunition is stored in a rotary ammo drum in the cargo hook hole, pulled through a flexible chute by an ammo booster, and fed to the grenade launcher. The system also has a box feed system in addition to the rotary AMMO drum. A master armament control panel is located in the instrument console and is accessible to both the pilot and copilot gunner. A flexible hand control sight assembly mounts above the co-pilot's seat from which the co-pilot can sight and fire the system. The subsystem can also be fired in the stow position by either the pilot or co-pilot by means of a trigger switch on both cyclic stick grips. In this mode, the turret is flexible in elevation. An MWO has been applied to the subsystem to give the sight lead angle compensation. A dual range reticle has been applied for more accuracy at long range.

CHARACTERISTICS:

EFFECTIVE RANGE:	1500 meters
ELEVATION/DEPRESSION:	+15°, -35°
MUZZLE VELOCITY:	790 FPS
RATE OF FIRE:	230 SPM
TRAVERSE:	60° right and left
EMPTY WT: Box Fed: 233 lbs	LOADED WT: 335 lbs (*150 rds)
Rotary Drum Fed: 223 lbs	459 lbs (**300 rds)
AMMUNITION:	
TYPE:	Linked 40mm ammunition.
CAPACITY:	*150 rds **300 rds respectively
SIGHTING:	Reflex type: gunner/co-pilot operated in elevation and deflection.

MAINTENANCE AND SUPPLY:

	AVUM	AVIM and Depot
a. Maintenance Instruction:	TM 9-1010-207-12	Support TM 9-1010-207-35
b. Repair parts:	TM 9-1010-207-12,20P	34P
c. Special tools:	TM 9-1010-207-12,20P	34P
d. Shop sets: Not Applicable		

2-14. M5 Armament Subsystem, Grenade Launcher (CONT).

**MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND
OPERATING INSTRUCTIONS:**

<u>KIT</u>	<u>NSN</u>	<u>PUBLICATION</u>	<u>NICP</u>	<u>FUND REQUIREMENTS</u>
A	1560-00-753-7294	MWO 55-1520-211-34/33	B17	DA Allocated
C	1010-00-738-5811	TM 9-1010-207-12	B14	DA Allocated
*RAC	1560-00-936-4334	MWO 55-1520-211-30/32	B17	DA Controlled

Initial issue of kits is DA Controlled and Procurement Appropriation Army (PAA) funded. Repair parts other than initial MWO procurement items are stock funded.

*RAC – Rotary Ammo Can – Required to upgun the M5 subsystem.

Operational instructions for subsystem can be found in TM 66-1520-220 series manual.

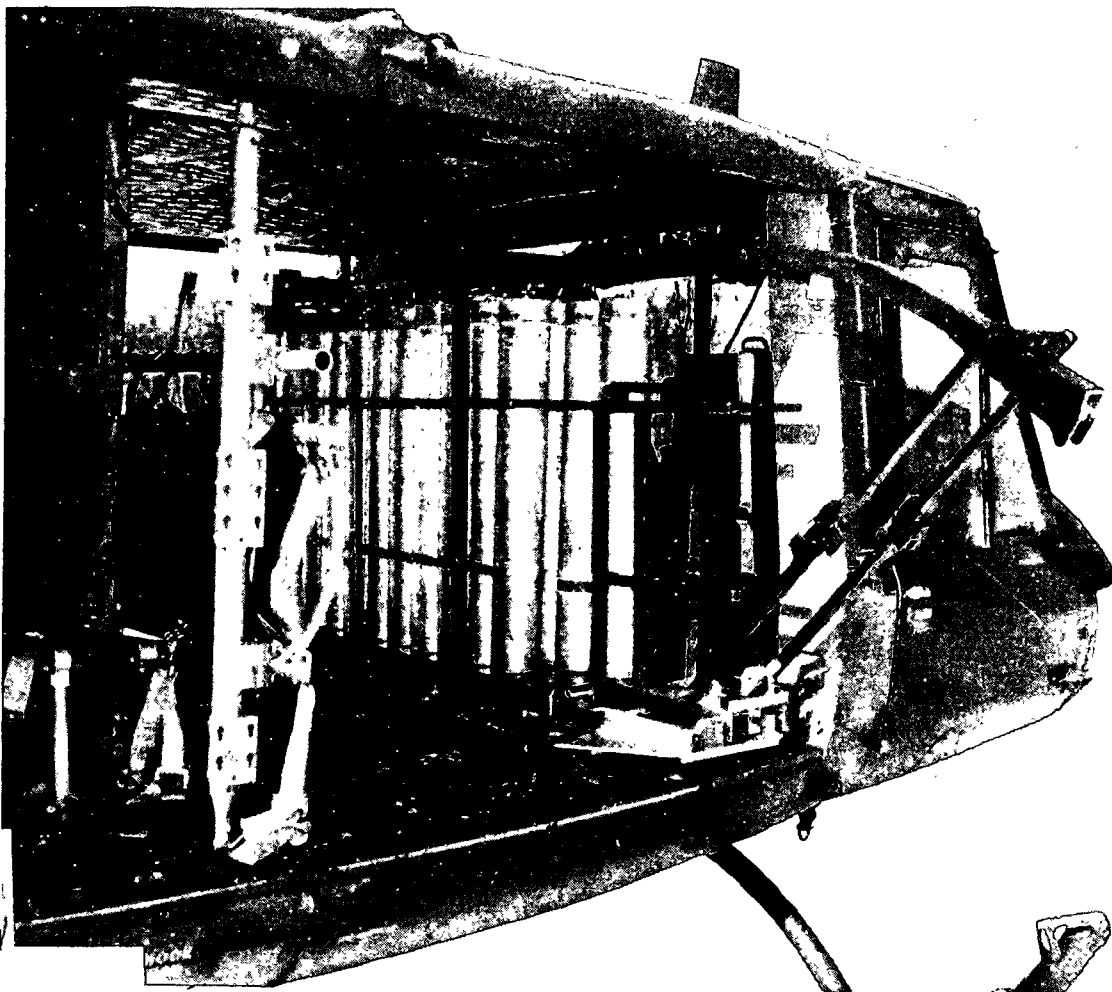


Figure 2-11. M19 Dispenser

2-15. M19 Dispensing Subsystem.

Dispenser: M19
 Aircraft: UH-1/B/C/D/H
 Average procurement price: \$1,500
 Application: One in troop cargo compartment
 Flares per dispenser: 24 Flares, MK45 w/adaptor
 Weight: 150 lbs empty
 822 lbs with flares
 Overall Length: 118 inches w/snout extended
 81.0 inches w/snout collapsed
 Width: 16.0 inches
 Height: 46.0 inches
 Rate of Ejection: Manually controlled

 Elevation: Attitude of aircraft
 Transverse: Attitude of aircraft
 Sighting: Visual assessment
 Status: LP
 DODIC: L106

DESCRIPTION: MK45 Flares are loaded into the dispenser with pull cable assembly disk inserted in the overhead track. Immediately prior to launch, the flare safety pin is pulled. The flare to be launched is positioned so that its base is stopped by the foot on the base tray. The operator then pushes the upper portion of the flare outward. The base of the flare then swings outward, providing sufficient force on the pull cable assembly to shear a pin, permitting the flare to fall free. A pull pin is provided for manual jettisoning of the load and flare rack.

MK45 Flare, Aircraft, Parachute.

Illumination: 2,000,000 candlepower
 Burntime: 210 seconds
 Weight: 28 lbs
 Overall Length: 36 inches
 Diameter: 4.87 inches
 Adjustable Time: Mechanical/pyrotechnic fuze
 Status: Std
 Logistic
 Control Code: B
 DODIC: 1370-L424

DESCRIPTION: Prior to launch, the fuze is set for the desired drop delay (in feet below the aircraft), and the safety pin removed. When launched, the weight of the falling flare against the pull cable exerts sufficient force to break a shear pin to initiate the delay and subsequently ignite the fuze. At the desired time, the parachute/candle assembly is ejected from the outer container, and activated. Near the end of burning, the parachute is collapsed and the spent flare falls rapidly to the ground.

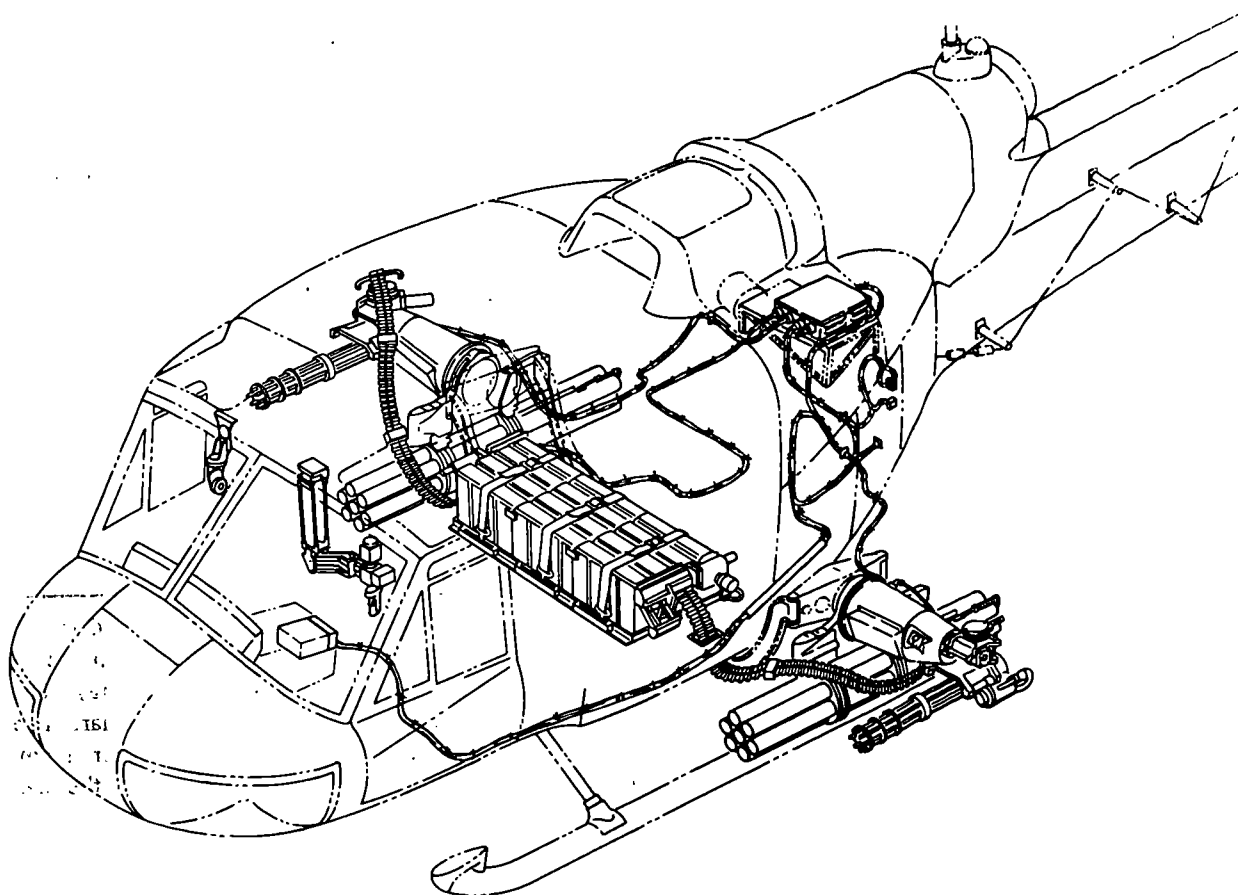


Figure 2-12. M21 Armament subsystem installed on UH-1B/C/M (Iroquois) helicopter

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2-16. M21 Armament Subsystem.

ARMAMENT SUBSYSTEM: M21

APPLICABLE AIRCRAFT – TYPE, MODEL, SERIES: Utility aircraft, UH-1B, C, M

AVERAGE PROCUREMENT PRICE: \$51,897

TYPE CLASSIFICATION: Standard

LOGISTIC CONTROL CODE: A

NOMENCLATURE: Armament subsystem, helicopter, 7.62mm twin high rate machine gun with 2.75 inch rocket launchers.

DESCRIPTION: The M21 armament subsystem combines the 7.62 mm, high rate of fire machine gun M134 and the 2.75 inch Folding Fin Aerial Rocket (FFAR), M158A1 launchers. The subsystem consists of two remotely controlled, power operated, flexible pylons, each mounting one 7.62mm machine gun M134 and provisions for a non-flexible rocket pod containing seven 2.75 inch FFAR. The rocket launcher installation on each pylon contains associated hardware to fire the rockets and to jettison the launcher. Linked 7.62mm ammunition is stowed inboard and transported to the guns through flexible chuting. A flexible sighting system enables the copilot to remotely aim and fire the machine guns. The pilot may fire either the rockets or the machine guns when in stow position using a fixed sight. The subsystem utilizes all standard 7.62mm NATO ammunition and 2.75 inch rockets applicable to the M158A1 launcher.

CHARACTERISTICS:

MAXIMUM EFFECTIVE RANGE:

Machine Gun: 1500 meters

Rocket: 3000 meters

RATE OF FIRE:

MUZZLE VELOCITY:

TRAVERSE:

SIGHTING:

EMPTY WEIGHT: 804 lbs

AMMUNITION:

TYPE:

CAPACITY:

ROCKETS:

TYPE:

CAPACITY:

ELEVATION DEPRESSION:

Machine Gun: +10° to -85°

Rocket Launcher: Boresight only

2000 or 4000 SPM

2750 FPS

Machine guns, inboard 12°, outboard 70° in azimuth from longitudinal axis

Pilot-manual reflex type for machine gun and rocket. Copilot/gunner flexible reflex type sight for machine gun only

LOADED WEIGHT: 1179.2 lbs

Linked 7.62MM

6000 rds

2.75 inch FFAR

14 RDS

2-16. M21 Armament Subsystem (CONT).**MAINTENANCE AND SUPPLY:**

Maintenance	AVUM	AVIM and Depot
Instruction:	TM 9-1090-202-12	Support TM 9-1090-202-35
Repair Parts:	TM 9-1090-202-20P	-34P*
Special Tools:	TM 9-1090-202-20P	-34P*
*To be published		

MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:

<u>KIT</u>	<u>NSN</u>	<u>PUBLICATION</u>	<u>NICP</u>	<u>FUND REQUIREMENT</u>
A	1560-00-915-8931	MWO 55-1520-211-30/8	B17	DA Allocated
B	1560-00-915-8933	TM 55-1520-211-20/5	B17	DA Allocated
C	1090-00-923-5971	TM 9-1090-202-12	B14	DA Allocated
	*1560-00-923-3182	MWO 55-1520-211-30/12	B17	Free Issue

Initial issue of kits is DA Allocated, DA Controlled, and Procurement Appropriation Army (PAA) funded. Repair parts other than initial MWO procurement items are stock funded.

Operational instructions for subsystem can be found in TM 55-1520-220 series manual.

*Sight Stow Bracket required if not previously installed.

In addition to the above, these modifications can be installed only in aircraft which have the following provisions:

M3/M6 "A" Kit, FSN 1560-960-4043, publication MWO 55-1520-221-40/4, NICP B17, DA Allocated M16 "A" Kit, FSN 1560-918-7007, publication MWO 55-1520-211-30/4, NICP B17.

Initial issue of rocket launchers, M158A1, FSN 1055-805-0689, is provided with subsystem.

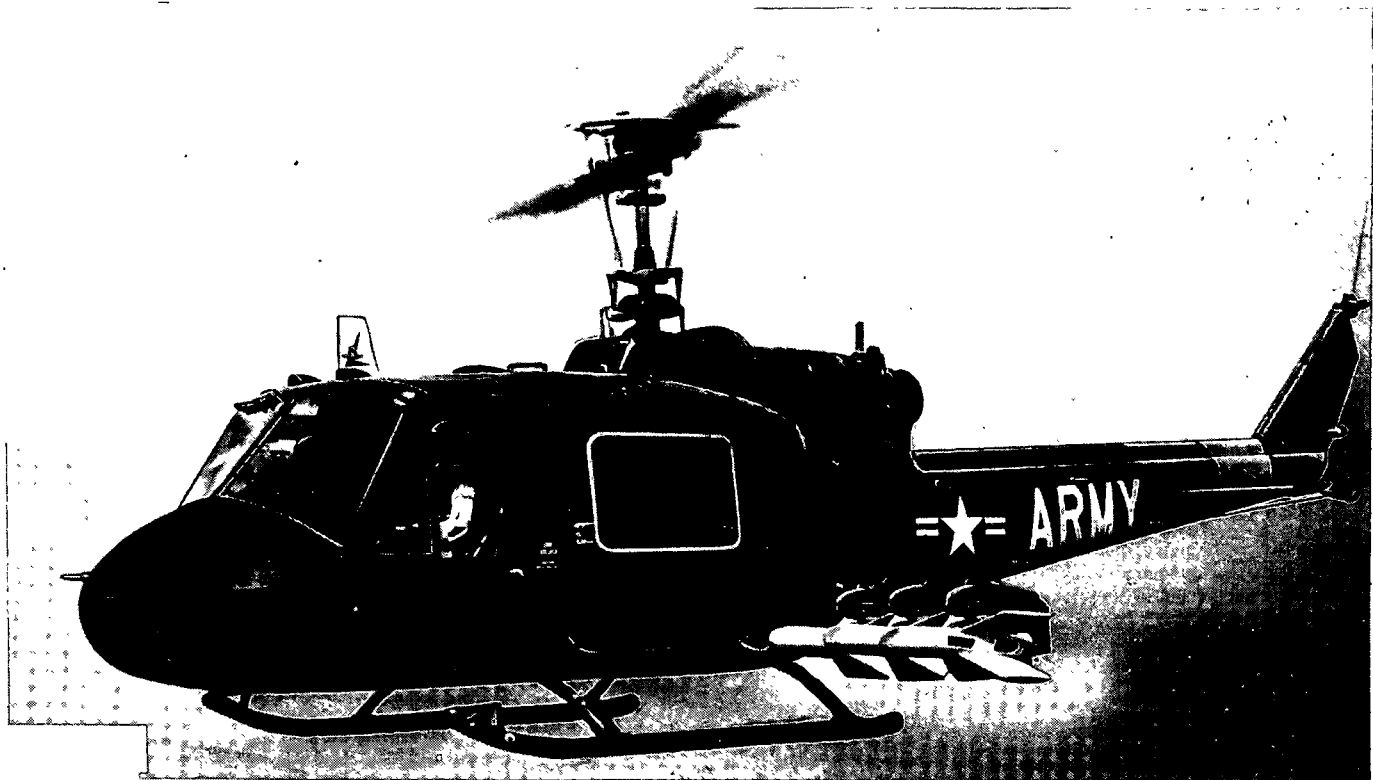


Figure 2-13. M22 Armament system installed on UH-1B/C (Iroquois) helicopter

2-17. M22 Armament Subsystem, Guided Missile Launcher.

ARMAMENT SUBSYSTEM: M22
 APPLICABLE AIRCRAFT – TYPE, MODEL, SERIES: UH-1B/C
 AVERAGE PROCUREMENT PRICE: \$34,000 (estimate)
 TYPE CLASSIFICATION: Standard
 LOGISTIC CONTROL CODE: A

NOMENCLATURE: Armament subsystem, helicopter, guided missile launcher.

DESCRIPTION: The M22 system includes a guidance control box, missile selector box, control stick, and six launchers. Items required to complete the airborne subsystem are an MK-8 pilots sight, a stabilized optical 6X sight for the gunner, two booms for mounting launchers (three per side), and jettisoning equipment. An adaption kit is required for attachment of system components to the helicopter. Operation of the subsystem requires close coordination between pilot and co-pilot/gunner.

CHARACTERISTICS:

EFFECTIVE RANGE:	3000 meters
ELEVATION:	Missile directed in flight by wire command link.
MISSILE VELOCITY:	180 meters/second cruise
RATE OF FIRE:	As selected by pilot/gunner.
TRAVERSE:	Missile directed in flight by wire command link.
EMPTY WT: 272 lbs	LOADED WT: 650 lbs
MISSILE CAPACITY:	6 missiles (3 each side)
AMMO TYPE:	AGM-22B Missile, 63 lbs each
SIGHTING:	Pilot MK8 lighted roof mounted. Co-pilot/gunner 6x42 power anti-collision binocular (M-55) or monocular (M-58.)
DATA:	Complete outboard stores are jettisonable, or each missile.

MAINTENANCE AND SUPPLY:

Maintenance instruction:	AVUM	AVIM support
	TM 9-1400-461-20 and -35	
Repair parts:	TM 9-1400-461-12P and -35P	
Special tools:	TM 9-1400-461-12P and -35P	
Shop sets:	TM 9-1400-461-12P and -35P	

MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:

Operational Instructions contained in TM 55-1520-219-10 and TM 55-1520-220-10 manuals.

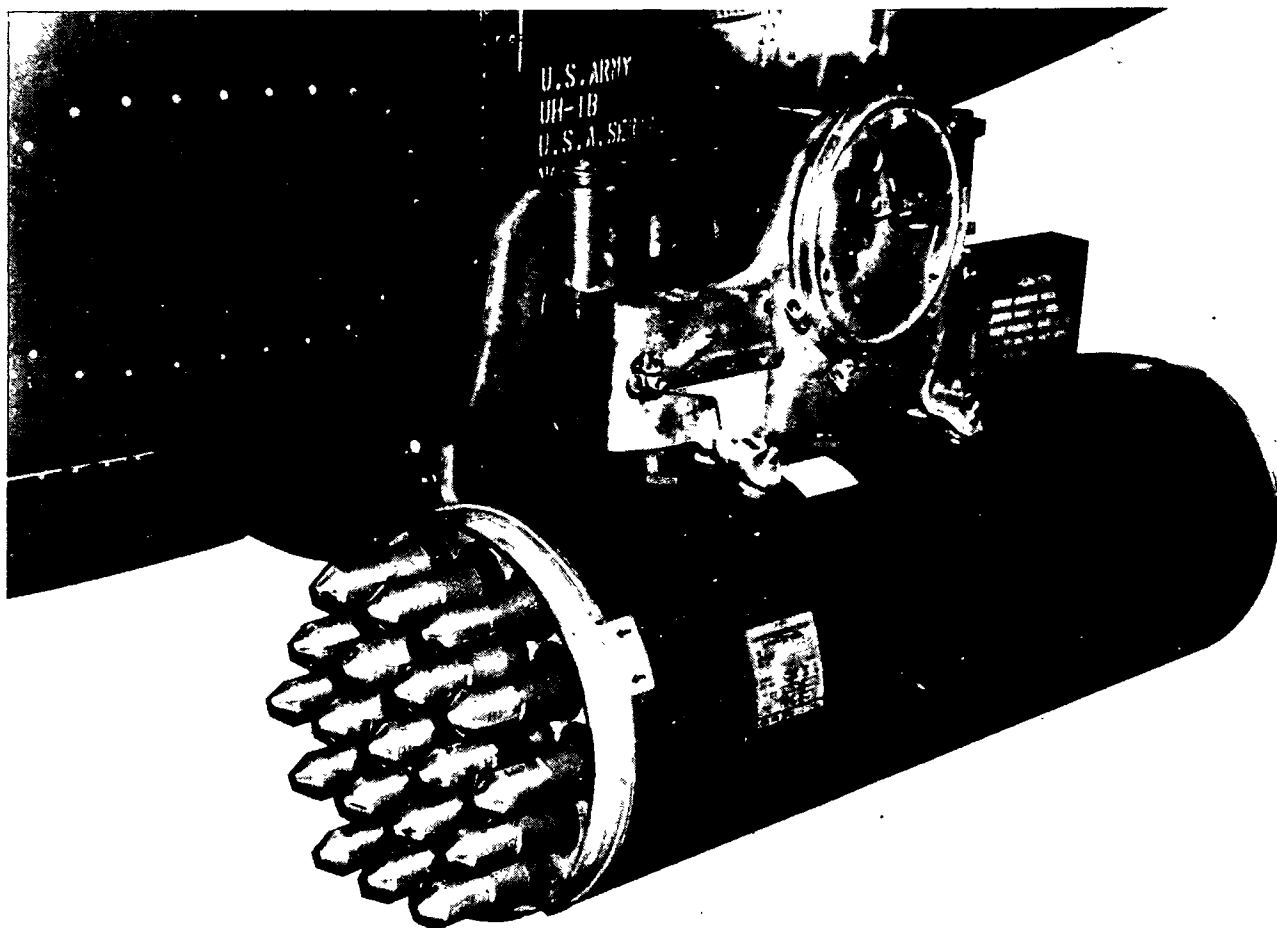


Figure 2-14. M156 Armament subsystem (Shown with M200A1 rocket launcher)

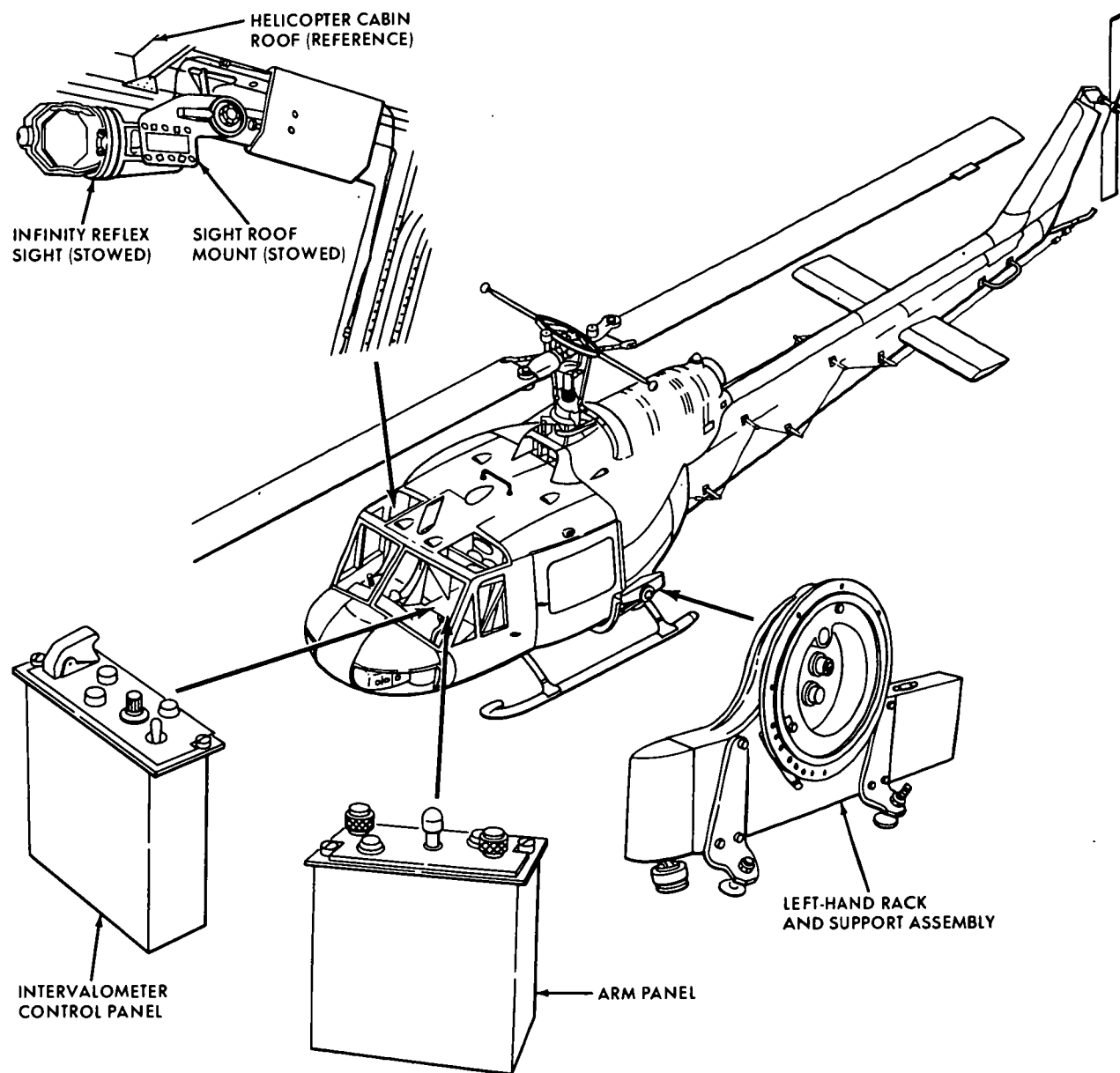


Figure 2-15. M156 Armament subsystem components

2-18. M156 Armament Subsystem.

ARMAMENT SUBSYSTEM: M156
 APPLICABLE AIRCRAFT: UH-1B/C/M
 AVERAGE PROCUREMENT PRICE: \$10,595
 TYPE CLASSIFICATION: Limited Procurement
 LOGISTIC CONTROL CODE: U

NOMENCLATURE: Mount, multiarmament, helicopter

DESCRIPTION: This item consists of two separate mounts, one mount installed on each side of the UH-1 helicopter. It is capable of carrying and firing the M158A1 and M200A1 2.75 inch rocket launchers or carrying external stores suspended from 14 inch bomb racks, MA-4A. The external stores cannot exceed 540 lbs per mount. A product improvement proposal which will enable the M156 to carry a fully loaded 19 tube rocket launcher using the new heavy warhead rocket has been evaluated for incorporation into the subsystem.

CHARACTERISTICS:

EFFECTIVE RANGE:	Not applicable
ELEVATION:	Fixed
TRAVERSE:	Fixed
EMPTY WEIGHT:	82 lbs without launcher
LOADED WEIGHT:	540# per mount, maximum
SIGHTING:	XM60 Reflex

MAINTENANCE AND SUPPLY:

Maintenance	AVUM	AVIM and Depot
Instruction:	TM 9-1090-204-12	-34
Repair parts:	TM 9-1090-204-20P	-35P
Special tools:	TM 9-1090-204-20P	-35P
Shop sets:	Not applicable	

MODIFICATION DATA:

ORGANIZATIONAL INSTRUCTIONS:	TM 55-1520-219-10.
	TM 55-1520-220-10.

REMARKS: For Rocket Loading information, see figure 2-32, 2.75 inch Rockets and Rocket Launchers.

2-19. M158A1, 2.75 Inch Rocket Launcher (7-Tube).

Rocket Launcher:	M158A1	
Aircraft Series:	UH1B/C/M	AH-1
Average Procurement Price:	\$382.	
Type Classification:	STD A	
Logistic Control Code:	A	

Nomenclature: Launcher, Rocket Aircraft, 2.75 Inch – M158A1 (7-Tube).

Description: The M158A1 is a reparable 7-tube 2.75 inch rocket launcher used on the UH1/B/C/M and AH1 Aircrafts. It is 58 inches long and weighs 48 lbs.

Remarks: TOE Authorization – not available this printing.

Basis of Issue: Approved BOI not available.
 For planning purposes:
 2 each per UH-1B/C/M armed with M21 Subsystem.
 1 each per AH-1 aircraft (all).



Figure 2-16. Launcher, rocket aircraft, 2.75 inch-M158A1 (7-tube)

2-20. M200A1 2.75" Rocket Launcher (19-Tube).

Rocket Launcher:	M200A1
Aircraft Series:	UH1B/C/M AH-1
Reprocurement Price:	\$1,683, subject to procurement quantity
Type Classification:	STD A
Logistic Control Code:	A
Nomenclature:	Launcher, Rocket Aircraft, 2.75 inch M200A1.
Description:	The M200A1 is a 19-tube reparable 2.75 inch rocket launcher, used on the UH1B/C/M, AH1G Aircraft. It is 60.6 inches long and weighs 139 lbs.
Remarks:	TOE Authorization – not available this printing.
Basis of Issue:	Approved BOI not available. For Planning Purposes: 2 each per UH1B/C/M equipped with M156 mount 3 each per AH-1 aircraft

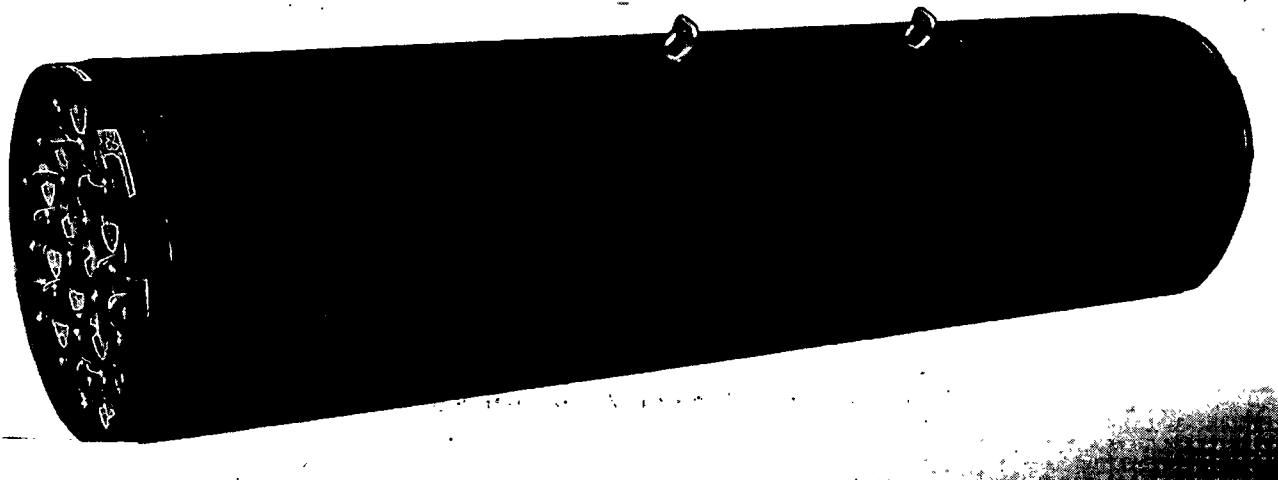
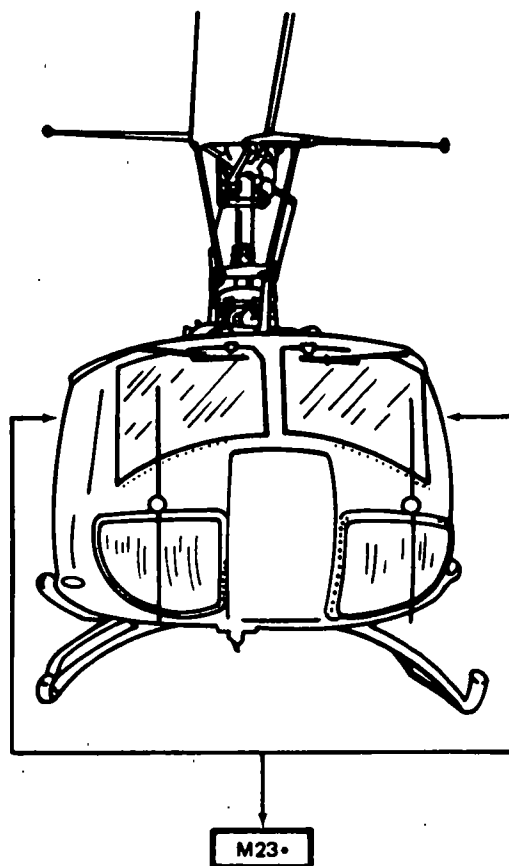


Figure 2-17. Launcher, rocket aircraft, 2.75 inch M200A-1 (19-tube)

2-21. UH-1D and H Armament Configurations.

•DOOR MOUNTED WEAPONS ONLY

Figure 2-18. UH-1D and H Armament configurations.

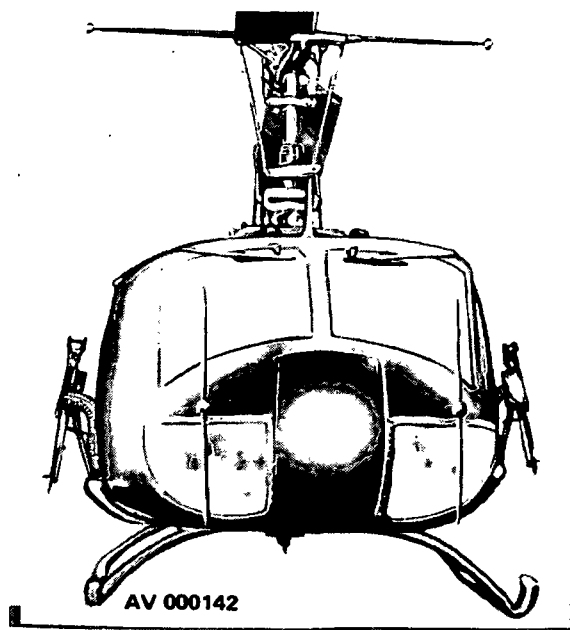


Figure 2-19. M23 Armament subsystem on UH-1D/H (Iroquois) helicopter

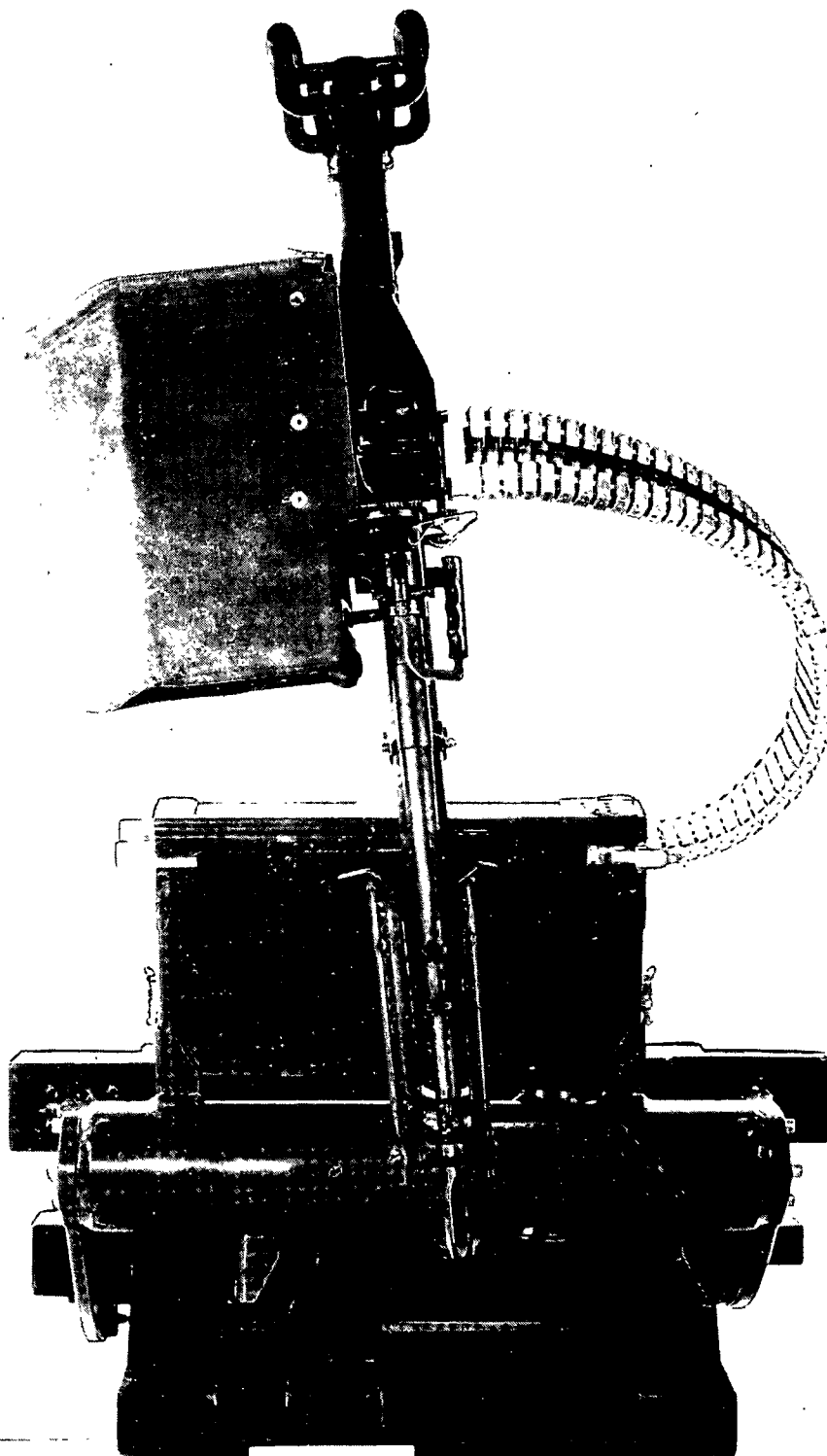


Figure 2-20. M23 Armament subsystem in forward stowed position (front view)

2-21. M23 Armament Subsystem.

ARMAMENT SUBSYSTEM: M23

APPLICABLE AIRCRAFT – TYPE, MODEL, SERIES: Utility UH-1D/H

AVERAGE PROCUREMENT PRICE: \$4,282

TYPE CLASSIFICATION: Standard

LOGISTIC CONTROL CODE: A

NOMENCLATURE: Armament subsystem, helicopter, door pintle mounted
7.62mm machine gun, M60D.

DESCRIPTION: The M23 armament subsystem consists of two 7.62mm, machine guns, M60D, and two mounts; one on each side of the aircraft in the doorways. The pintle post assembly is attached to a base tube assembly which is attached to hard points on the helicopter fuselage. The machine gun, which is a belt fed, gas operated, air-cooled automatic weapon, is attached to a pivot cradle on top of the pintle post. The base can be employed at either the right or left side, and the pedestal is designed for right or left installation. The machine gun installs on either right or left pintle mounts without adaptation, and is a modified machine gun, M60, with aircraft ring type sights, spade grips and an improved feed system. A rapid reloading capability is provided by a 550 round ammunition box attached to the weapon by a flexible chute. A canvas bag attaches to the right side of the receiver to catch links and ejected cartridges. Free traverse and elevation is allowed within fixed stop limits to prevent self-inflicted damage to the helicopter. The subsystem utilizes all standard 7.62mm ammunition.

CHARACTERISTICS:

MAXIMUM EFFECTIVE RANGE:	1100 meters
ELEVATION FORWARD:	+3.5°, AFT +6.5° DEPRESSION -80°
MUZZLE VELOCITY:	2750 FPS
RATE OF FIRE:	550 SPM
TRAVERSE:	2° to 178° in Azimuth
EMPTY WGT: 173 lbs	LOADED WGT: 210 lbs
AMMUNITION:	
CAPACITY:	550 rounds per gun
TYPE:	Linked 7.62mm
SIGHTING:	Aircraft ring type

MAINTENANCE AND SUPPLY:

Maintenance	AVUM AVIM and Depot
Instruction:	TM 9-1005-262-14
Repair parts:	TM 9-1005-262-24P
Special tools:	TM 9-1005-262-24P
Shop sets:	Not Applicable

MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:

<u>KIT</u>	<u>NSN</u>	<u>PUBLICATION</u>	<u>NICP</u>	<u>FUND REQUIREMENTS</u>
-	1005-00-907-0720	TM 9-1090-262-15	B14	DA Controlled

Operational instructions for subsystem can be found in TM 9-1005-262-15.

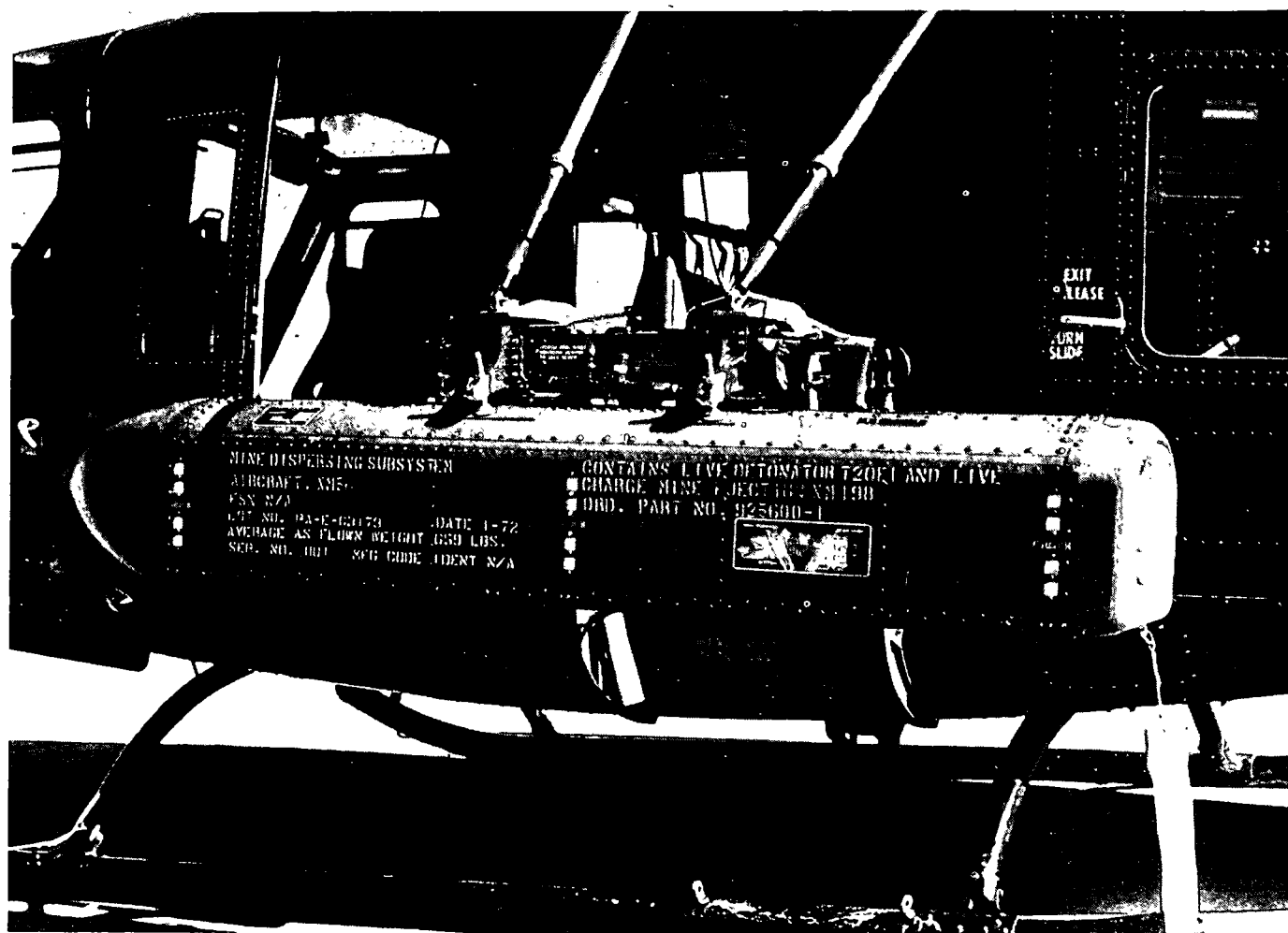


Figure 2-21. M56 Mine Disperser

2-22. M56 Aircraft Mine Dispersing Subsystem.

ARMAMENT SUBSYSTEM: M56
 APPLICABLE AIRCRAFT TYPE, MODEL, SERIES: UH:ID/H
 AVERAGE PROCUREMENT PRICE: \$10,640
 TYPE CLASSIFICATION: Standard
 LOGISTIC CONTROL CODE: A

NOMENCLATURE: Mine dispersing subsystem, aircraft

DESCRIPTION: The M56 is a helicopter mine dispersing subsystem consisting of a US Air Force SUU-13 dispenser containing 40 mine canisters. Each canister contains two antitank mines and one XM198 mine ejection charge. A battery is installed in each mine just prior to flight. Firing of the subsystem is controlled by the aircraft crew. Quantity and interval of mine canister firing is controlled from the cockpit. The mines will arm only after both ejection and impact. The minimum altitude for dispensing is 100 feet.

CHARACTERISTICS:

LENGTH:	90.4 inches
DIAMETER:	14.5 inches
EMPTY WEIGHT:	117 lbs
LOADED WEIGHT:	660 lbs
CAPACITY:	40 mines
SIGHTING:	None

MAINTENANCE AND SUPPLY:

Maintenance	Direct Support
Instruction:	TM 9-1345-201-30
Repair parts:	TM 9-1345-201-30
Special tools:	TM 9-1345-201-30
Shop sets	Not Applicable

MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:

Operational instructions contained in TM 9-1345-201-10-1

2-23. XM230EI Armament Subsystem, Helicopter, Turret Mounted, 30mm, YM230.**ARMAMENT SUBSYSTEM: XM230EI****APPLICABLE AIRCRAFT – TYPE, MODEL, SERIES: YAH-64A****AVERAGE PROCUREMENT PRICE: TBD****TYPE CLASSIFICATION: Development****LOGISTIC CONTROL CODE:****NOMENCLATURE: ARMAMENT SUBSYSTEM, HELICOPTER, TURRET MOUNTED, 30MM, XM230**

DESCRIPTION: Consists of the following major components: 30mm Chain Gun, Turret, Ammunition Storage and Transfer Mechanism and Control System. The Gun System is a 30mm XM230EI Hughes Chain Gun which fires 30mm XM788/789 (ADEN/DEFA class) ammunition having a rate of fire of 725 ± 25 RPM. The weapon with drive motor and recoil adapters attached weights 110 lbs. The Turret weight is 156 lbs.

CHARACTERISTICS:**Effective Range: 4000 Meters****Elevation: $+10^\circ$ to -60°** **Muzzle Velocity: 805 MPS****Rate of Fire: 725 ± 25 RPM****Traverse: $\pm 110^\circ$** **Empty Weight: 568 LBS.****Ammunition: 30mm XM788/789 and ADEN/DEFA class ammo****Capacity: 1215 Rounds****Sighting: IHAD SS and TADS****MAINTENANCE AND SUPPLY:****Maintenance****Instruction:****Repair Parts:****Special Tools:****Shop Sets:****AVUM and AVIM Support****TM 9-****TM 9-****TM 9-****TM 9-****MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:****KIT****NSN****PUBLICATION****NICP****FUND REQUIREMENTS**Operational instructions for subsystem can be found in **TM55-**

2-24. HMMS Hellfire Modular Missile System.

ARMAMENT SUBSYSTEM: Hellfire
APPLICABLE AIRCRAFT-TYPE, MODEL, SERIES: YAH-64A
AVERAGE PROCUREMENT PRICE: TBD
TYPE CLASSIFICATION: Development
LOGISTIC CONTROL CODE:

NOMENCLATURE: Hellfire Modular Missile System (HMMS)

DESCRIPTION:

The Point Target System (PTS) for the YAH-64A is comprised of the Hellfire Modular Missile System (HMMS) (missiles and launchers), Hellfire Missile Equipment (HME) (electronics and dedicated control panels), and associated multipurpose controls and displays. This system can be used with any of three seeker heads: Laser, RF/IR, or IRIS. The YAH-64A carries eight Hellfire missiles for the primary mission and up to sixteen missiles in alternate configurations.

CHARACTERISTICS:

Effective Range:
Missile Velocity:
Rate Of Fire: As Selected By Pilot/Gunner
Empty Weight:
Missile Capacity:
Ammo Type:
Sighting:

MAINTENANCE AND SUPPLY:

Maintenance Instructions:	AVUM and AVIM Support
Repair Parts:	TM 9-
Special Tools:	TM 9-
Shop Sets:	TM 9-

MODIFICATION DATA REQUIRED FOR INSTALLATION, FUNDING, CONTROLS, AND OPERATING INSTRUCTIONS:

<u>KIT</u>	<u>NSN</u>	<u>PUBLICATION</u>	<u>NICP</u>	<u>FUND REQUIREMENTS</u>
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Operational instructions for subsystem can be found in TM55-

2-25. Aircraft Armament Subsystems Ammunition.

7.62mm Cartridges*

MODEL DESIGNATION & TYPE	STATUS	PURPOSE	PACKAGING				DOT CLASSIFICATION	DODIC	REMARKS
			ROUNDS/ BOX	TYPE BOX	CU FT	WEIGHT POUNDS			
7.62mm Ball Linked 4/1 w/Tracer	STD	Anti- Personnel & Training	200	Metal M19A1	0.45	19	Small Arms Ammo C1 C QD 1	1305-A131	For M60 Series Guns
7.62mm Ball Linked 4/1 w/Tracer	STD	Anti- Personnel & Training	1500	Metal M548	1.30	120	Small Arms Ammo C1 C QD 1	1305-A165	Mini-Gun

NOTE: 1. Although other linked 7.62mm ammunition may be used with the above weapons, a basis of issue has not been established for other 7.62mm types or packs for Army aircraft application.

2. Only the primary DODIC is shown.

3. Although the two types of ammunition are interchangeable, the Mini-Gun type is preferred for its ease in loading and its quality features (polished brass, position of links, etc.).

* Reference TM 9-1305-200

Source: MUCOM (AMSMU-MS-IM)

Source: DRSAR-MAS-SS

3. Aircraft Armament Subsystems Ammunition (CONT).

50 Caliber Cartridges*

MODEL DESIGNATION & TYPE	STATUS	PURPOSE	PACKAGING				DOT CLASSIFICATION	DODIC	REMARKS
			ROUNDS/ BOX	TYPE BOX	CU FT	WEIGHT POUNDS			
.50 Caliber, 4 API Linked w/APIT	STD	Anti- Personnel & Anti- Material	100	Metal M2A1	.45	37.5	Small Arms Ammo C1 C QD I	1305-A577	
.50 Caliber, 4 Ball Linked w/Tracer	STD	Anti- Personnel & Training	100	Metal M2A1	.45	37.5	Small Arms Ammo C1 C QD I	1305-A577	

NOTE: API/APIT may also be linked 3 to 1 ratio and may also be issued for training.
Only primary DODIC is shown.

* Reference TM 9-1305-200

2-25. Aircraft Armament Subsystems Ammunition (CONT).

20mm Cartridges*

MODEL DESIGNATION & TYPE	STATUS	PURPOSE	PACKAGING			DOT CLASSIFICATION	DODIC	REMARKS
			ROUNDS/ BOX	TYPE BOX	CU FT	WEIGHT POUNDS		
M56A3 HEI Linked 4/1 with M220 TPT	STD	Anti- Personnel Light Anti- Materiel, Capable of Initiating Oil Fires	100	Metal M548	1.3	93	Ammo F/Cannon W/Expl. Proj. C1 A QD C1 7	1305-A653 For Gun M195 Range to 3000 meters
M55A2 TP Linked	STD	Target Practice	100	Metal M548	1.30	93	Small Arms Ammo C1 C QD 1	1305-A926 For Gun M195 Range to 3000 meters
M55A2 Linked 4/1 with M220 TPT	STD	Target Practice w/Tracer	100	Metal M548	1.30	93	Small Arms Ammo C1 C QD 1	1305-A896 For Gun M195 Range to 3000 meters

2-25. Aircraft Armament Subsystems Ammunition (CONT).

40mm Cartridges*

MODEL DESIGNATION & TYPE	STATUS	PURPOSE	PACKAGING				DOT CLASSIFICATION	DODIC	REMARKS
			ROUNDS/ BOX	TYPE BOX	CU FT	WEIGHT POUNDS			
M383 HE	STD	Anti- Personnel	50 (all linked)	Wood	1.2	53	Ammo F/Cannon W/Expl. Proj. Dot Shipp. C1 A QD C1 7	1310 B571	W/M16A2 link Ref. DTM 1310-221-12 (PA-AD-MB)
M384 HE	STD	Anti- Personnel	50 (all linked)	Wood	1.2	53	Ammo F/Cannon W/Expl. Proj. Dot Shipp. C1 A QD C1 7	1310 B572	W/M16 link
								1310 B470	W/M16A1 link Ref. POMM 1310-204-12 (PA-DB7)
M385 Practice	STD	Practice (Solid Aluminum or Plastic Proj)	50 (all linked)	Wood	1.2	53	Ammo F/Cannon W/Inert Proj. Dot Shipp. C1 C QD C1 1	1310 B576	W/M16 link
								1310 B480	W/M16A1 link
M430 HE DP	STD	Anti- Personnel Anti- Materiel (Shaped Chg)	50 (all linked)	Wood	1.2	53	Ammo F/Cannon W/Expl. Proj. Dot Shipp. C1 A QD C1 7	1310 B542	W/M16A2 link Ref. DTM 1310-223-12 (PA-AD-MB)
XM677 HE T	Develop- ment	Anti- Personnel W/Tracer	50 (linked 1 rd to every 3 M383/M384)	Wood	1.2	53	Ammo F/Cannon W/Expl. Proj. Dot Shipp. C1 A QD C1 7	1310 B529	Ref. DTM 1310-217-12 (PA-DB7)
XM677 HE T								1310 B527	
XM683 HE	Develop- ment	Anti- Personnel (extended ranged RAP)	50 (all linked)	Wood	1.2	53	Ammo F/Cannon W/Expl. Proj. Dot Shipp. C1 A QD C1 7	1310 B471	Rocket Assisted Projectile Extended Range 3000 meters max. Ref. DTM 1310-220-12 (PA-DB7)
XM684 HE	Contin- gency	Anti- Personnel	50 (all linked)	Wood	1.2	53	Ammo F/Cannon W/Expl. Proj. Dot Shipp. C1 A QD C1 7	1310 B573	VT Fuze W/M383 Proj. Body W/M16A2 link Ref. DTM 1310-218-12 (PA-DB7)

2-25. Aircraft Armament Subsystems Ammunition (CONT).

40mm Cartridges* (CONT).

NOTES: 1. All rds linked with M16A1 link unless otherwise specified.

2. Those rds linked with M16 link are for use Armament Subsystem using M75 Automatic Grenade Launcher. Those rds linked w/M16A1 or M16A2 links are suitable for use in Armament Subsystem using the M75 or M129 Automatic Grenade Launcher.

Source: AARCOM (DRSAR-MAS-SS)

2-26. Aircraft Armament Subsystems Rockets.**2.75 inch Rockets***

TYPE	STDZN	PURPOSE	PACKAGING				DOT CLASS	FSC & DODIC	REMARKS Wpn Lchr M158A1 M200A1
			RDS/Per Box	Type	Cu Ft	Wt Lbs			
Rkt 2.75" Flech w/whd WDU-4A/A w/base fuze w/Mtr MK40	A	Anti- Personnel	4 and 25	Wood	3.0 17.9	127 776	A	1340-H459	Same
Rkt 2.75" HEAT w/whd MK5 w/Fuze MK181 w/ Mtr MK40	B	Armor Piercing Anti- Personnel	3 4	Wood Wood	2.8 3.2	102 125	A	1340-H487	Same
Rkt 2.75" HE w/whd M229 w/Fuze M429 w/Mtr MK40	A	Anti- Personnel	4 and 25	Wood Wood	3.47 20.8	162 996	A	1340-H488	Same
Rkt 2.75" HE w/whd M151 w/Fuze M429 w/ Mtr MK40	A	Anti- Personnel	4 and 25	Wood Wood	3.0 17.9	127 776	A	1340-H489	Same
Rkt 2.75" HE w/whd M151 w/Fuze M423 w/Mtr MK40	A	Anti- Personnel Anti- Materiel	4 and 25	Wood Wood	3.0 17.9	127 776	A	1340-H490	Same
Rkt CML Agt 2.75" SMK WP M156 w/Fuze M423 w/ Mtr MK40	A	Target Marking & Incendiary	4 and 25	Wood Wood	3.0 17.9	127 776	A	1340-H519	Same
Rkt 2.75" HE w/whd M229 w/Fuze M423 w/Mtr MK40	A	Anti- Personnel Anti- Materiel	4 and 25	Wood Wood	3.47 20.8	162 996	A	1340-H534	Same
Rkt 2.75" Practice WTU-1/B whd/slug w/ Mtr MK40	A	Practice & Training	4 and 25	Wood Wood	3.0 17.9	127 776	B	1340-H828	Same
Rkt 2.75" Illumination w/whd M257 w/Fuze MBO w/Mtr MK40	A	Target Illumination	3 whds w/fuze, 3 Mtrs unassembled	Wood	3.0	117	A	1340-T012	Same

2-26. Aircraft Armament Subsystems Rockets (Cont).

2.75 inch Rockets*

TYPE	STDZN	PURPOSE	PACKAGING				DOT CLASS	FSC & DODIC	REMARKS Wpn Lchr M158A1 M200A1
			RDS/Per Box	Type	Cu Ft	Wt Lbs			
Rkt 2.75" Practice XM243 whd w/Fuze M435 w/Mtr MK40	LP-T	Training & Testing	4 and 25	Wood Wood	3.47 20.8	162 996	B	1340-H468	Same
Rkt 2.75" HEAT Whd M247 w/Fuze PIBD M438 w/Mtr MK40		Armor Piercing Anti- Personnel	4 and 25	Wood Wood	3.47 20.8	147 886	A	1340-H826 (will replace 1340-H487)	Same
Rkt 2.75" HE w/ Whd M229 w/Fuze XM433 w/Mtr MK40		Selectable Functioning f/Bunker Penetration & Anti- Personnel	4 and 25	Wood Wood	3.47 20.8	162 996	A	1340-H469	M200A1 Mod
Rkt 2.75" HE w/ Whd M151 w/Fuze XM433 w/Mtr MK40		Selectable Functioning f/Bunker Penetration & Anti- Personnel	4 and 25	Wood Wood	3.0 17.9	127 776	A	1340-H471	M200A1 Mod
Rkt 2.75" Flech w/ Whd XM255 w/Fuze RC XM439		Selectable Functioning Anti- Personnel Anti- Materiel	4 and 25	Wood Wood	3.0 17.9	127 776	A	1340- (will replace 1340-H459)	M200A1 Mod

Source: MIRADCOM (DRCPM-RK)

2-27. Aircraft Armor Systems.

Armor protection against enemy small arms fire is provided for Army aircraft crew and critical components. Types of crew protection include armored seat bottoms, side panels, and floor plates. Protection of critical components is provided by

means of armor for engine, fuel and oil accessories, and flight control items. The amount and placement of protective armor varies among different types of aircraft systems. The U-6, U-1, U-8, U-9, U-10, U-21, T-41, T-42, C-12 and UV-18 do not have armor. The backing for armor in the existing aircraft is mostly fiberglass. In the future fiberglass may be replaced by KEVLAR.

2-27. Aircraft Armor Systems (Cont).

AIRCRAFT	SYSTEM	ARMOR WEIGHT	MATERIAL	PART NO.	FSN
AH-1G/S TH-1G	Crew and component protection	243 lb/acft	B ₄ C with Fiberglass Backing	N/A - Furnished with aircraft and not available in kit form.	
CH-47A	Crew protection (Aerosmith seat)	234 lb/acft	Al ₂ O ₃ with Fiberglass Backing	1560-CH47-225	1680-912-3944
CH-47A/B/C	Crew protection (AlSCO seat)	139 lb/acft	Al ₂ O ₃ with Fiberglass Backing	1560-CH47-300	1680-947-9829 ✓
CH-47A/B	Component protection	491 lb/acft	DPS and Fire Suppression Foam	113550-3	1560-945-4828 ✓
CH-47C	Component protection	510 lb/acft	DPS and Fire Suppression Foam	113759-2	1560-725-6073 ✓
CH-54A	Crew and component protection	1164 lb/acft	B ₄ C with Fiberglass and DPS	6407-75100-013	1680-073-8396
CH-54B	Crew and component protection	1233 lb/acft	B ₄ C with Fiberglass and DPSA	N/A - Furnished with aircraft and not available in kit form.	
OH-6A	Crew and component protection	119 lb/acft	B ₄ C with Fiberglass Backing and DPS	1560-OH6-000-3	1560-133-8381
OH-58A	Crew and component protection	112 lb/acft	B ₄ C with Fiberglass Backing	N/A - Furnished with acft and not available in kit form.	
OH-58C	Crew protection	108 lb/acft	B 4 C with Fiberglass Backing	N/A -	
UH-1B/C/D/H/M/V EH-1H, EH-1X	Crew protection	210 lb/acft	Al ₂ O ₃ with Aluminum Backing	178061-3 and 178062-3	✓ 1680-933-9384 and ✓ 1680-933-9385
UH-1B/C/D/H/M/V EH-1H, EH-1X	Gunner protection	46 lb/acft	Al ₂ O ₃ with Aluminum Backing	1560-UH1-350-1	✓ 1680-067-8208 ✓
UH-60A	Crew protection	260 lb/acft	B 4 C with KEVLAR	N/A - Furnished with aircraft and not available in kit form.	

2-27. Aircraft Armor Systems (Cont).

AIRCRAFT	SYSTEM	ARMOR WEIGHT	MATERIAL	PART NO.	FSN
OV-1 B/C	Crew protection consisting of combinations of: (1) Nose armor, KA-60 camera provisions 63 lb/acft (2) Nose armor, SLAR provisions 53 lb/acft (3) Nose armor, without KA-60 and SLAR provisions 65 lb/acft (4) Side armor, homing antenna provisions 21 lb/acft (5) Side armor, without homing antenna provisions 19 lb/acft (6) Side armor, side panel with circuit breaker panel aft center right panel 24 lb/acft (7) Side armor, side panel without circuit breaker panel 25 lb/acft (8) Side armor, side panel common to all aircraft 68 lb/acft (9) Extended side armor and floor armor on OV-1C, 181 lb/acft		Al ₂ O ₃ with Fiberglass Backing	1560-OV1-120-1	1560-947-3446
				1560-OV1-121-1	1560-947-3447
				1560-OV1-122-1	1560-947-3448
				1560-OV1-123-1	1560-947-3451
				1560-OV1-124-1	1560-947-3452
				1560-OV1-125-1	1560-947-3453
				1560-OV1-126-1	1560-947-3449
				1560-OV1-127-1	1560-947-3450
				1560-OV1-006-1	1560-943-0754
OV-1D	Provisions only for armor. When armor is added, its weight will be the same as OV-1C		Al ₂ O ₃ with Fiberglass backing	See OV-1B/C	See OV-1B/C
RV-1D	Provisions only for armor. When armor is added, its weight will be the same as OV-1B		Al ₂ O ₃ with Fiberglass Backing	See OV-1B/C	See OV-1B/C

Al₂O₃ - Aluminum oxide composite armorB₄C - Boron carbide composite armor

SiC - Silicon carbide

DPS - Dual property steel armor

Source: TSARCOM (DRSTS-ME)

2-28. AH-1G/S and TH-1G Armor

a. The AH-1G/S and TH-1G aircraft are provided with aircrew and critical component armor. The pilot's seat is made of dual hardness steel armor. The fixed side panels are made of a hard faced composite material. The entire passive defense system for the gunner is made of a hard faced composite material.

b. Critical component armor is located on each side of the engine to protect the engine compressor section and the fuel control unit. The standard fuel cells are self-sealing as follows: bottom 33% capacity against .50 caliber, center 33% capacity 30 caliber, and the top 34% is not self-sealing. The fuel crossover line is also self-sealing. The new crashworthy fuel cells are self-sealing against 20mm over their entire capacity. The fuel crossover line is self-sealing.

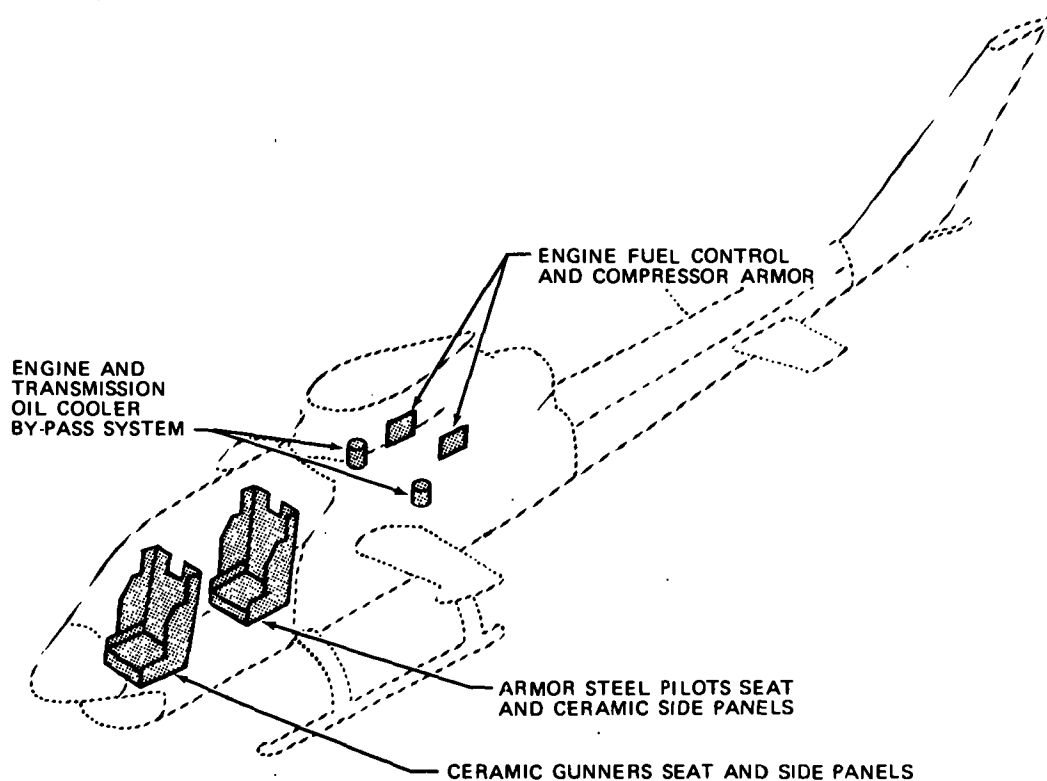


Figure 2-22 AH-1G/S and TH-1G Armor

2-29. CH-47 Armor.

a. The CH-47 aircraft are provided with aircrew and critical component armor.

b. The aircrew armor material is aluminum oxide hard faced composite capable of defeating 30 caliber projectiles.

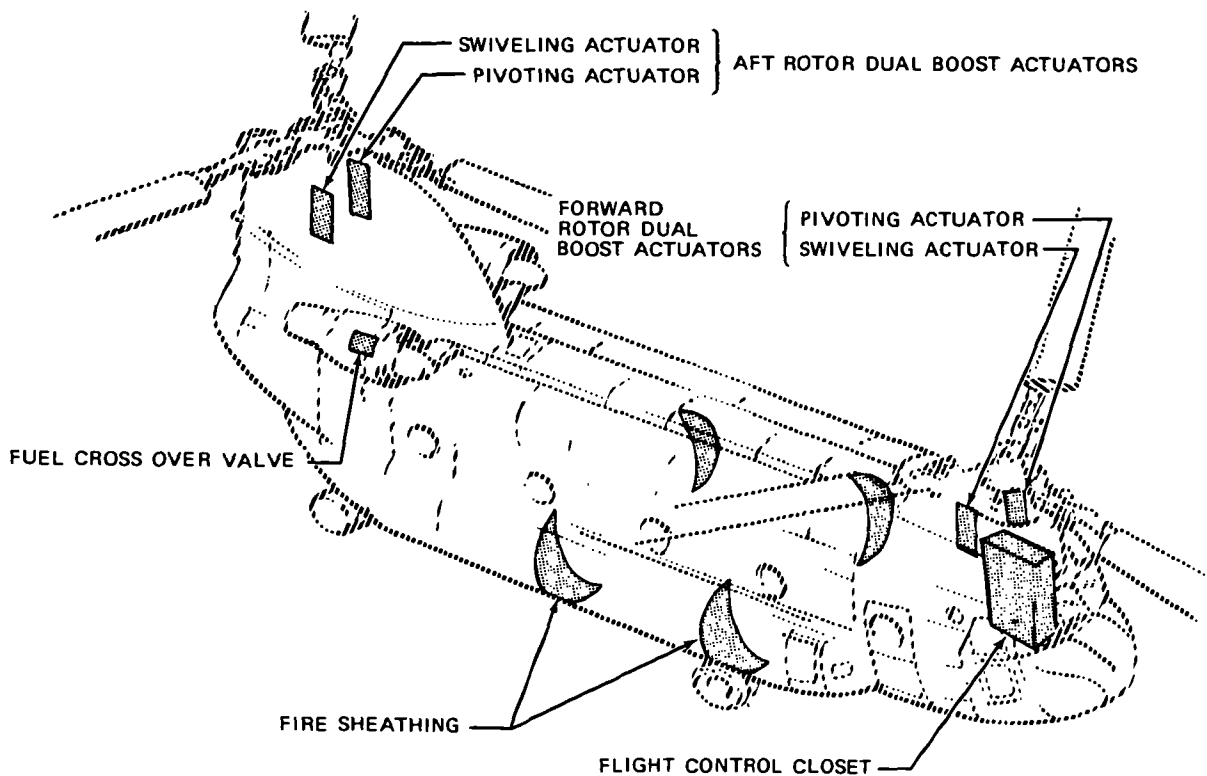
c. DPS armor has been provided for the following critical components:

(1) Armor for the fore and aft flight control actuators in four locations.

(2) Armor for the flight control closet.

(3) Armor for the fuel crossover valve.

(4) Fire suppression foam on fore and aft faces of both fuel tanks.



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Figure 2-23. CH-47 Armor

2-30. Armor for the Armed and Armored Chinook.

a. Armor for the armed and armored Chinook consists of aircrew and component armor. The pilot and copilot have been provided with a crash attenuating integral 30 caliber armor seat.

b. The total installed weight of the armor system is 2700 pounds. Armor is provided for the following critical components:

(1) Controls closet area of flight controls system.

(2) Swiveling and pivoting dual actuators in forward and aft pylons.

(3) Copilot's control box.

(4) Linkage from copilot's controls to closet.

(5) Flight controls mix complex.

(6) Walking beam rod ends and bellcrank.

(7) Aft fuselage controls, rods, and bellcrank.

(8) Aft pylon controls, rods, and bellcrank.

(9) Accessory gear box, quill shaft.

c. The armor material is dual property steel capable of defeating 50 caliber API projectiles.

2-31. CH-54A Armor.

a. The CH-54A aircraft are equipped with aircrew and critical component armor. The pilot, copilot, and aft facing pilot are provided with armor placed on and around the existing seats. Protection is provided for the back, bottom, and sides. Frontal protection is via chest protector.

b. The 30 caliber armor material is primarily a boron carbide hard faced composite with dual hardness steel protecting the rod ends and bellcranks on the transmission deck. The weight of the armor for the pilot's seat is 120 pounds, for the copilot's seat is 111 pounds, and for the aft facing pilot's seat is 86 pounds. Armor is provided for the following critical components:

(1) Servos, rod ends, and bellcranks under the pilot's floor.

- (2) Controls closet.
- (3) External rod ends and bellcranks.
- (4) Armored panel between the engine for separation purposes.
- (5) Main servos.
- (6) Primary hydraulic reservoir.
- (7) Fuel tank sumps.
- (8) Tail rotor servo control.
- (9) Incorporation of a dual tail rotor control cable.

c. Total increase in aircraft weight is 1167 pounds.

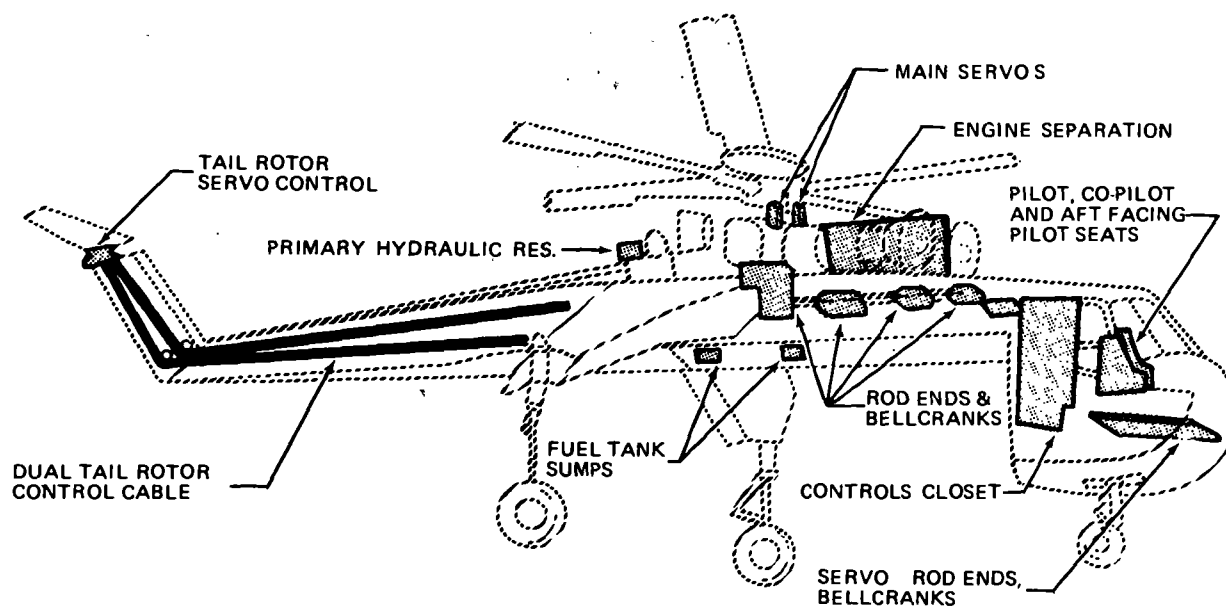


Figure 2-24. CH-54 Armor

2-32. OH-6A Armor.

a. The passive protection system for the OH-6A aircraft consists of aircrew and critical component armor. The pilot and copilot is provided with armor placed on the existing seats. Protection is provided for the back, bottom, and sides. Frontal protection is via chest protector.

b. The armor material is a 30 caliber boron carbide hard faced composite except for the panel under the seat and the engine compressor panel which are of dual property steel.

c. The weight of the complete installed system is 130 pounds.

d. Armor is provided for the following critical components:

- (1) Engine compressor.
- (2) Self-sealing oil lines.
- (3) Self-sealing fuel lines.
- (4) Engine and transmission oil cooler bypass valves.
- (5) Fuel control valve.

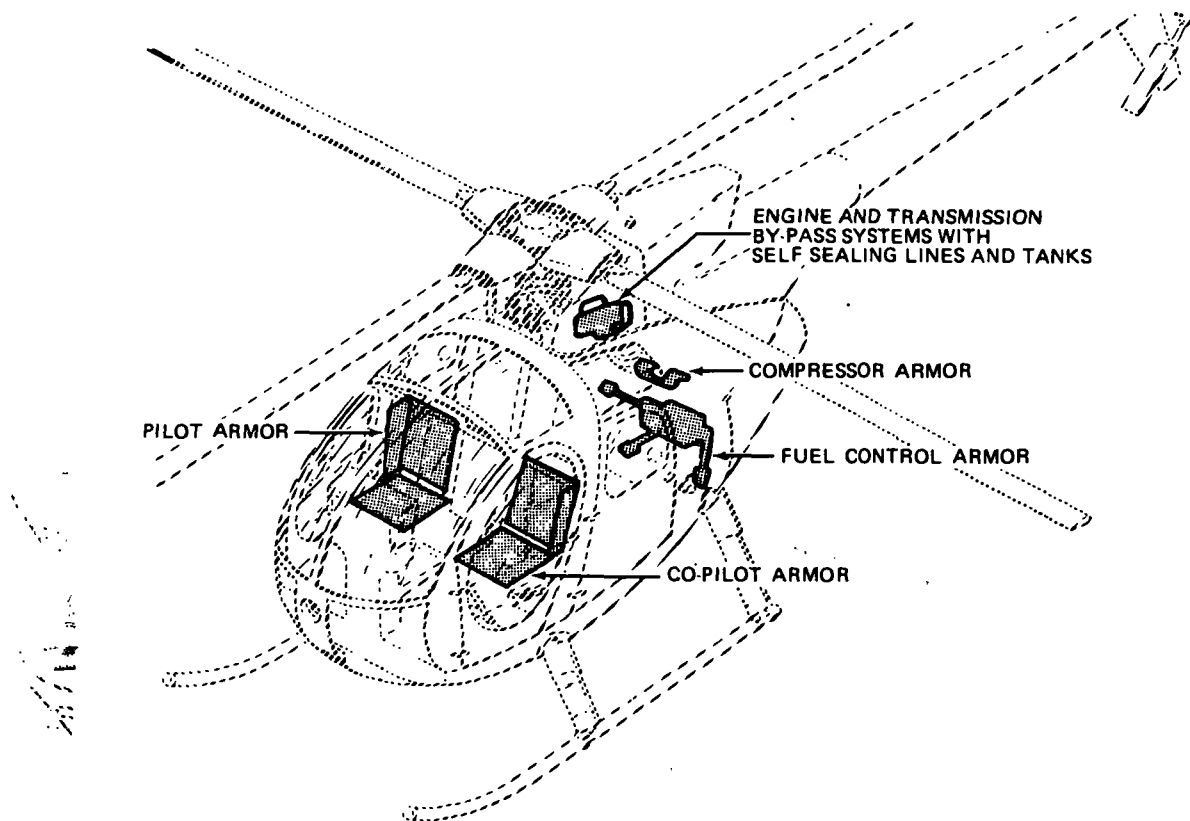


Figure 2-25. OH-6A armor

2-33. UH-1 Series Armor.

a. The UH-1 series aircraft are equipped with aircrew armor for the pilot and copilot. The armor consists of an integrated armored seat. Protection is provided from the bottom, rear, and sides. Frontal protection is via chest protector.

b. The armor material is aluminum oxide hard faced composite capable of defeating 30 caliber projectiles.

c. The headguard is an armor panel which attaches to the back of the seats. The gunner's seat armor unit is a plate of armor material securely fastened to the crew seats in the UH-1. It is provided with a cushion for the crewman to sit on.

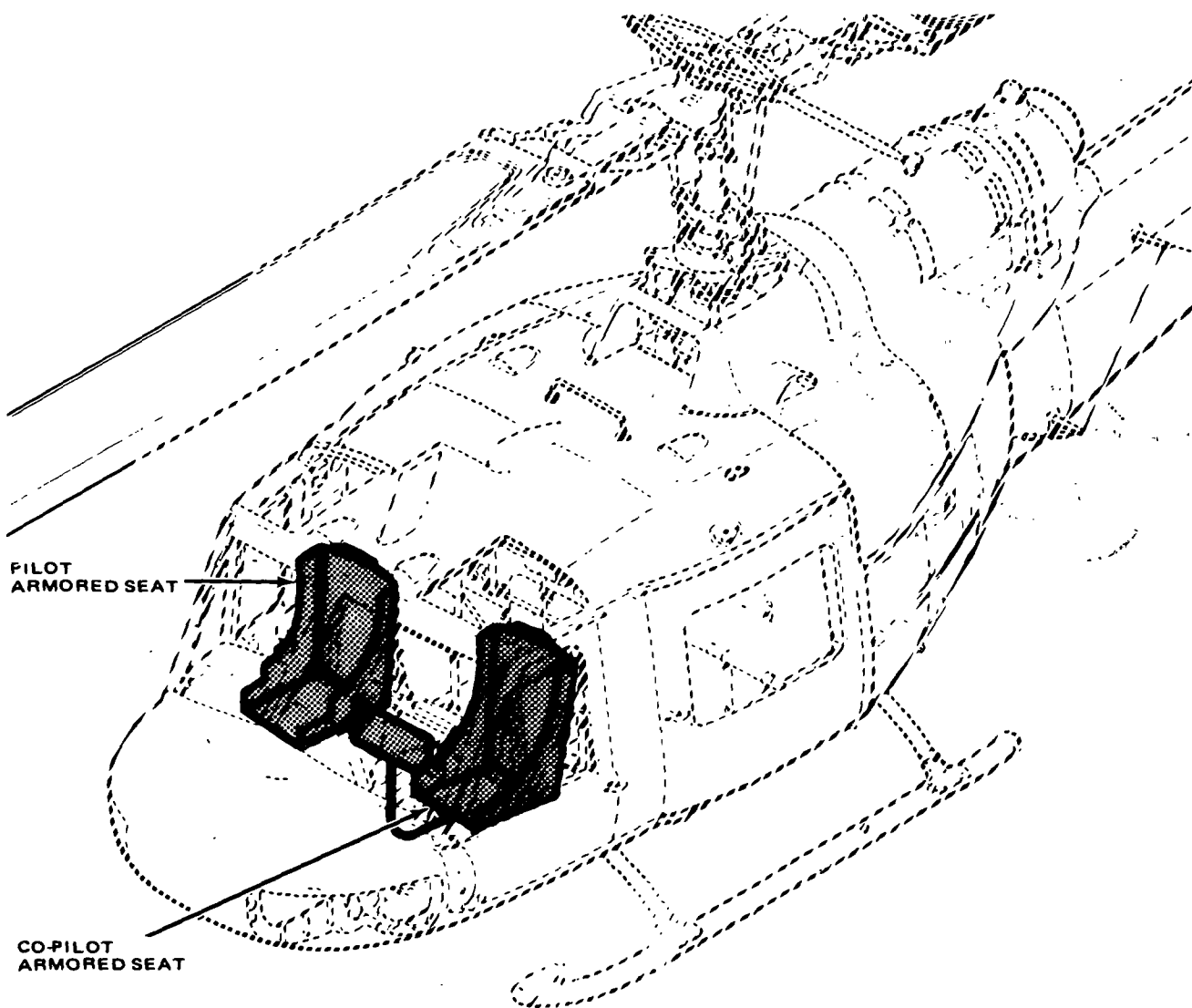


Figure 2-26. UH-1 Armor

2-34. OV-1 Armor.

a. The OV-1 aircraft are provided with aircrew and critical component armor. The aircrew armor is located on the nose bulkhead cockpit sides, floor, hatch, and forward windows. This armor had to be mounted on the airframe since the ejection seat would not tolerate the weight.

b. The material used for aircrew armor is a 30 caliber aluminum oxide hard faced composite system. Critical component protection, which protects a

hydraulic valve in the landing gear system, is dual property steel armor.

c. Due to the various aircraft and avionic configurations, different armor sub-kits are required for any one model. All OV-1C aircraft require five of these sub-kits, while the OV-1B requires only four. The extended side and floor armor sub-kit provided for the OV-1C is not used on OV-1B aircraft due to weight and balance considerations. Consequently the armor systems for the OV-1C model aircraft weigh 360 pounds as opposed to 180 pounds for the OV-1B.

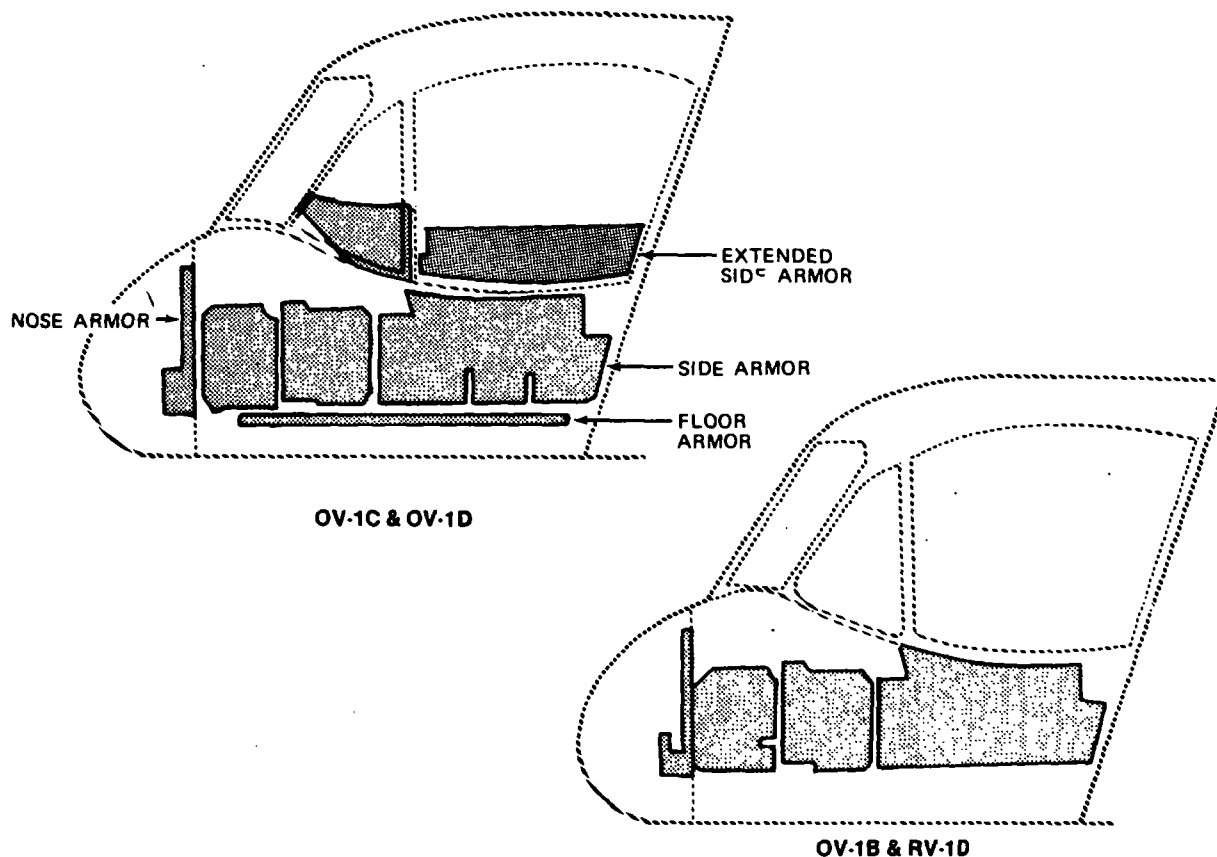


Figure 2-27. OV-1 Armor

Section III. FERRYING AND SHIPPING

2-35. Surface Shipment.

Preparation of large numbers of aircraft for simultaneous mass movement by ocean transport had its inception in the latter part of June 1965.

Deployment of the 1st Cavalry Division (Airmobile) involved movement of a large number of aircraft, which was a first of this type and magnitude for the U. S. Army. Since the operation involved movement of approximately 500 aircraft, staging areas had to be established to receive, process, and marshal in

accordance with the numbers designated for each of four vessels. Ports of loading were designated at Brookley Air Force Base, Mobile, Ala., and Mayport Naval Base, Jacksonville, Fla.

As a result of the experience with the 1st Cavalry Division deployment and other vessel shipments of aircraft to Southeast Asia, time/motion studies have provided input for developing the following table relating to processing Army aircraft for surface shipment.

Source: DRSTS-SDP

2-36. Surface Shipment Processing Time.

MAN HOURS (M/H) AND ELAPSED TIME (ET) RQR TO PROCESS 1 EA. FOR OVERSEAS SHIPMENT					MAN-HOURS AND ELAPSED TIME TO DEPROCESS 1 EA.				REFERENCED PUBLICATION
Type of Aircraft	Top Deck Reusable		Below Deck		Top Deck Reusable		Below Deck		
	M/H	ET	M/H	ET	M/H	ET	M/H	ET	
AH-1 ¹	12 ²	2 ²	18	3	6	1	12	2	TM55-1500-339S
CH-47	24 ¹	4	NA	NA	18	3	NA	NA	TM1-CH47S
CH-54	48 ¹	6	NA	NA	56	8	NA	NA	TM1-CH54S
OH-6A	NA	NA	3	1	NA	NA	3	1	TM1-OH6-S
OH-58	NA	NA	3	1	NA	NA	3	1	TM55-1500-338S
UH-1 ¹	12 ²	2 ²	18	4	6	1	12	2	TM55-1500-219S
U-8D, RU-8	40	5	NA	NA	48	6	NA	NA	TM1-U8-S
U21/RU21	40	5	NA	NA	48	6	NA	NA	TM1-U21S
OV-1	45	5	NA	NA	55	9	NA	NA	TM1-OV1-S
UH-60A ³	3	3	3	3	3	3	3	3	3

¹ Cover sets are not items to be requisitioned. Only CONUS and overseas outloading points preparing aircraft for movement are authorized to request cover sets.

² Not recommended, covers should be used if placed on top deck.

³ Not available, if information is needed contact DRSTS-SDP (2)

2-37. Air Shipment Processing Time.

Aircraft Type	Air Force Aircraft	No. of Aircraft Loaded	Required Disassembly	Disassembly Time per Aircraft		Reassembly Time per Aircraft		Referenced Publications
				M/H	ET (Hrs)	M/H	ET (Hrs)	
AH-1	C-5	12	Main rotor blades, stub wings, tail rotor blades, synch elevators ejector tube assembly.	8	2	12	3	TM55-1500-339-S
		15	Same, plus Low Profile Skid	14	4	15	5	
	C-141	3	Main rotor blade & hub, mast & swash plate assy, stub wings, tail rotor blades, fairing assys, transmission cowlings, antennas, ejector tube assy synch elevators, landing skids.	24	4	36	6	
	C-130	1	Same, less synch elevators & landing skids.	21	3	24	4	
CH-47	C-5	3	Rotary wing blades forward cowlings ring & fairing assys, forward transmission pkg, aft pylon pkg.	174	32	225	36	TM1-CH47-S
CH-54	C-5	3	Main rotor blades, tail rotor blades, stabilizer assy, antennas & poles, main landing gear & support. Separate cockpit from fuselage at station 210.	180	16	225	36	TM1-CH54-S
OH-6A	C-5	26	Main rotor blades, horizontal stabilizer, upper vertical stabilizer.	6	3	6	3	TM1-OH6-S
	C-141	6	Same	6	3	6	3	
	C-130	3	Same	6	3	6	3	
OH-58	C-5	13	Main rotor blades, vertical stabilizer.	1.5	.5	2	1	TM55-1500-338S
		22	Same, plus "piggy-back" configuration.	3	1	6	3	

Source: DRSTS-SDP

2-37. Air Shipment Processing Time (Cont).

Aircraft Type	Air Force Aircraft	No. of Aircraft Loaded	Required Disassembly	Disassembly Time per Aircraft		Reassembly Time per Aircraft		Referenced Publications
				M/H	ET (Hrs)	M/H	ET (Hrs)	
OH-58 (Cont.)	C-141	4	Main rotor blades & hub & mast, vertical stabilizer.	7.5	1.5	10	3	
		8	Same, plus "piggy-back" configuration.	3	1	6	3	
	C-130	4	Same, plus tail rotor blades.	3	1	6	3	
UH-1 C,D, H,M,V EH-1H EH-1X	C-5	8	Main rotor blades, stabilizer bar, synch elevators, antennas, hinged panels.	12	3	18	5	TM55-1500-219S
		11 (C, M)	Same, plus "piggy-back" configuration.	16	4	26	7	
	C-141	1 or 2	Main rotor blades, stabilizer bar, rotor head & mast assy, tail rotor blades, skid landing gear, antennas, rearview mirror, cargo suspension assy.	24	4	32	5	
		3 (D, H)	Same, plus "side-saddle" configuration.	30	5	40	7	
	C-130	1	Same	24	4	32	5	
		2 (D, H)	Same, plus "side saddle" configuration.	30	5	40	7	
UX-8/RU-8	C-5	4	Wings	16	4	32	8	TM2-U8-S
U-21/ RU-21*	C-5	4	Wings	16	4	32	8	TM1-U21-S

*Not practical due to disassembly requirements.

2-37. Air Shipment Processing Time (Cont).

Aircraft Type	Air Force Aircraft	No. of Aircraft Loaded	Required Disassembly	Disassembly Time per Aircraft		Reassembly Time per Aircraft		Referenced Publications
				M/H	ET (Hrs)	M/H	ET (Hrs)	
OV-1B, C, D*	C-5	3	Engines, wings, horizontal stabilizer, outboard vertical stabilizers, drop tanks, flaps, antennas.	305	38	750	94	TM1-OV1-S
	C-141	1	Same, plus propellers, center vertical stabilizer, main & nose landing gears, air scoop, cowlings & fairings, aileron pushrods, tubing.	402	50	950	119	
T-42A*	NA	NA	NA	NA	NA	NA		NVAL
UH-60A	C-5							
	C141	2	* *	* *				
	C130	1	* *	* *				

*Not practical due to disassembly requirements.

**Information not available, if needed contact TSARCOM(DRSTS-SDP)(2).

NOTE: Current U.S. Army manuals for air shipment are not always current with Air Force doctrine, nor do they reference appropriate Military Airlift Command (MAC) regulations. Therefore, Computerized Air Planning Service (CAPS) at Langley Air Force Base or the nearest MAC command post should be asked to provide current policies.

2-38. Weight and Cube for Crated Shipment.

TYPE OF AIRCRAFT	WEIGHT (LB)	CUBE (CU FT)
AH-1G	10,000	2800
AH-1S	10,000	2800
CH-47A	*	*
CH-47B	*	*
CH-47C	*	*
CH-54A	*	*
CH-54B	*	*
OH-6A	*	*
OH-58A	5,000	1,280
UH-1B	10,409	2,241
UH-1C	10,610	2,241
UH-1D	12,500	2,400
UH-1H	13,937	3,213
UH-1M	10,610	2,241
TH-55A	*	*
U-8D	*	*
U-8F	*	*
U-8G	*	*
U-10A	NVAL	NVAL
U-21/RU-21	*	*
OV-1B	*	*
OV-1C	*	*
OV-1D	*	*
T-41B	*	*
T-42A	*	*

(*)Crating of aircraft not recommended

Section IV. TOOLS*

2-39. Aircraft Shop Sets/Tool Kits/Tool Sets (Common).

Aircraft special tools listing are not included in this manual. Refer to the Technical Publications listed in Chapter 1, Section IV (Standard Aircraft Characteristics).

2-40. Shop Sets.

NOMENCLATURE	SM/SC
Shop set, aircraft maintenance, ground handling and servicing, Set A, direct support (Army) (NSN-1730-00-999-6194)	SC 1730-99-CL-A01
Shop set, aircraft maintenance, ground handling and servicing, Set B, direct support (Army) (NSN 1730-00-999-6195)	SC 1730-99-CL-A02
Shop set, aircraft maintenance, ground handling and servicing, Set C, general support (Army) (NSN 1730-00-999-6193)	SC 1730-99-CL-A03
Shop set, aircraft ground handling and servicing, airmobile, direct support maintenance, Battalion GHS (NSN 1730-00-900-8316)	SC 1730-99-CL-A04
Shop set, aircraft maintenance, fixed base, flaw detection, Set A, direct support (NSN 4920-00-321-9353)	SC 4920-99-CL-A01
Shop set, aircraft maintenance, fixed base, sheet metal, Set A, direct support (Army) (NSN 4920-00-944-1005)	SC 4920-99-CL-A02
Shop set, aircraft maintenance, fixed base, sheet metal, Set B, direct support (Army) (NSN 4920-00-944-1006)	SC 4920-99-CL-A03
Shop set, aircraft, maintenance, fixed base, sheet metal, Set C, general support (Army) (NSN 4920-00-944-0996)	SC 4920-99-CL-A04
Shop set, aircraft maintenance, fixed base, hydraulic, Set A, direct support (NSN 4920-00-321-9363)	SC 4920-99-CL-A05
Shop set, aircraft maintenance, fixed base, hydraulic, Set B, direct support (NSN 4920-00-321-9364)	SC 4920-99-CL-A06

*Source: DRSTS-SLDT(1)

2-39. Shop Sets (Cont).

NOMENCLATURE	SM/SC
Shop set, aircraft maintenance, fixed base, hydraulic, Set C, general support (NSN 4920-00-321-9373)	SC 4920-99-CL-A07
Shop set, aircraft maintenance, fixed base, welding, Set A, direct support (NSN 4920-00-321-9375)	SC 4920-99-CL-A08
Shop set, aircraft maintenance, fixed base, welding, Set B, direct support (NSN 4920-00-321-9376)	SC 4920-99-CL-A09
Shop set, aircraft maintenance, fixed base, welding, Set C, general support (Army) (NSN 4920-00-944-0785)	SC 4920-99-CL-A10
Shop set, aircraft maintenance, fixed base, tool crib, Set A, direct support (NSN 4920-00-321-9397)	SC 4920-99-CL-A11
Shop set, aircraft maintenance, fixed base, tool crib, Set B, direct support (NSN 4920-00-321-9403)	SC 4920-99-CL-A12
Shop set, aircraft maintenance, fixed base, tool crib, Set C, general support (NSN 4920-00-321-9405)	SC 4920-99-CL-A13
Shop set, aircraft maintenance, fixed base, electrical, Set A, direct support (Army) (NSN 4920-00-944-0761)	SC 4920-99-CL-A14
Shop set, aircraft maintenance, fixed base, electrical, Set B, direct support (Army) (NSN 4920-00-944-0760)	SC 4920-99-CL-A15
Shop set, aircraft maintenance, fixed base, electrical, Set C, general support (Army) (NSN 4920-00-944-0757)	SC 4920-99-CL-A16
Shop set, aircraft maintenance, fixed base, flaw detection, Set B, direct support (NSN 4920-00-321-9410)	SC 4920-99-CL-A17
Shop set, aircraft maintenance, fixed base, flaw detection, Set C, general support (NSN 4920-00-321-9411)	SC 4920-99-CL-A18
Shop set, aircraft maintenance, fixed base, paint, Set B, direct support (Army) (NSN 4920-00-944-0759)	SC 4920-99-CL-A19
Shop set, aircraft maintenance, fixed base, paint, Set C, general support (Army) (NSN 4920-00-944-1007)	SC 4920-99-CL-A20
Shop set, aircraft maintenance, fixed base, instrument, Set B, direct support (NSN 4920-00-321-9416)	SC 4920-99-CL-A21

2-39. Shop Sets (Cont).

NOMENCLATURE	SM/SC
Shop set, aircraft maintenance, fixed base, instrument, Set C, general support (Army) (NSN 4920-00-944-0784)	SC 4920-99-CL-A22
Shop set, aircraft maintenance, fixed base, engine, Set B, direct support (Army) (NSN 4920-00-944-0884)	SC 4920-99-CL-A23
Shop set, aircraft maintenance, fixed base, engine, Set C, general support (Army) (NSN 4920-00-944-0786)	SC 4920-99-CL-A24
Shop set, aircraft maintenance, fixed base, propeller and rotor, Set B, direct support (Army) (NSN 4920-00-944-1014)	SC 4920-99-CL-A25
Shop set, aircraft maintenance, fixed base, propeller and rotor, Set C, general support (Army) (NSN 4920-00-944-1015)	SC 4920-99-CL-A26
Shop set, aircraft maintenance, fixed base, power train, general support (Army) (NSN 4920-00-944-0838)	SC 4920-99-CL-A27
Shop set, aircraft maintenance, semitrailer mounted, A-1, tool crib, electrical, flaw detection, direct support (NSN 4920-00-621-2032)	SC 4920-99-CL-A28
Shop set, aircraft maintenance, semitrailer mounted, A-2, sheet metal, welding, hydraulic, direct support (NSN 4920-00-621-2033)	SC 4920-99-CL-A29
Shop set, aircraft maintenance, semitrailer mounted, B-1, tool crib and flaw detection, direct support (NSN 4920-00-621-2034)	SC 4920-99-CL-A30
Shop set, aircraft maintenance, semitrailer and trailer mounted, B-2, electrical, instrument, and hydraulic, direct support (NSN 4920-00-621-2035)	SC 4920-99-CL-A31
Shop set, aircraft maintenance, semitrailer mounted, B-3, sheet metal and welding, direct support (NSN 4920-00-621-2036)	SC 4920-99-CL-A32
Shop set, aircraft maintenance, semitrailer mounted, B-4, machine and engine shop, direct support (NSN 4920-00-621-2037)	SC 4920-99-CL-A33

2-39. Shop Sets (Cont).

2a\	NOMENCLATURE	SM/SC
	Shop set, aircraft maintenance, trailer mounted, B-6, paint shop, direct support (NSN 4920-00-621-2038)	SC 4920-99-CL-A34
	Shop set, aircraft maintenance, semitrailer mounted, C-1, tool crib, general support (NSN 4920-00-621-2039)	SC 4920-99-CL-A35
	Shop set, aircraft maintenance, semitrailer and trailer mounted, C-2, electrical shop, general support (NSN 4920-00-621-2040)	SC 4920-99-CL-A36
	Shop set, aircraft maintenance, semitrailer mounted, C-3, flaw detection, general support (NSN 4920-00-621-2041)	SC 4920-99-CL-A37
	Shop set, aircraft maintenance, semitrailer mounted, C-4, sheet metal, general support (NSN 4920-00-621-2042)	SC 4920-99-CL-A38
	Shop set, aircraft maintenance, semitrailer mounted, C-5, welding, general support (NSN 4920-00-621-2043)	SC 4920-99-CL-A39
	Shop set, aircraft maintenance, semitrailer mounted, C-6, machine shop, general support (NSN 4920-00-621-2044)	SC 4920-99-CL-A40
	Shop set, aircraft maintenance, semitrailer mounted, C-7, engine and hydraulic, general support (NSN 4920-00-621-2045)	SC 4920-99-CL-A41
	Shop set, aircraft maintenance, semitrailer mounted, C-8, instrument shop, general support (NSN 4920-00-621-2046)	SC 4920-99-CL-A42
	Shop set, aircraft maintenance, trailer mounted, C-10, paint shop, general support (NSN 4920-00-621-2047)	SC 4920-99-CL-A43
	Shop set, aircraft maintenance, semitrailer mounted, B-5, propeller and rotor, direct support (NSN 4920-00-649-6509)	SC 4920-99-CL-A44
	Shop set, aircraft maintenance, semitrailer mounted, C-9, propeller and rotor, general support (NSN 4920-00-649-6509)	SC 4920-99-CL-A45
	Shop set, aircraft maintenance, semitrailer mounted, C-11, power train, general support (NSN 4920-00-649-6510)	SC 4920-99-CL-A46

2-39. Shop Sets (Cont).

NOMENCLATURE	SM/SC
Shop set, aircraft maintenance, airmobile, direct support section, airmobile division (NSN 4920-00-906-9727)	SC 4920-99-CL-A47
Shop set, aircraft maintenance, airmobile, tool crib, direct support maintenance, Battalion set No. 1 (NSN 4920-00-906-9728)	SC 4920-99-CL-A48
Shop set, aircraft maintenance, airmobile, electrical, instrument, hydraulic, direct support maintenance, Battalion set No. 2 (NSN 4920-00-906-9729)	SC 4920-99-CL-A49
Shop set, aircraft maintenance, airmobile, sheet metal and welding, direct support, Battalion set No. 3 (NSN 4920-00-906-9730)	SC 4920-99-CL-A50
Shop set, aircraft maintenance, airmobile, machine and engine, direct support maintenance, Battalion set No. 4 (NSN 4920-00-906-9731)	SC 4920-99-CL-A51
Shop set, aircraft maintenance, airmobile, propeller and rotor, direct support maintenance, Battalion set No. 5 (NSN 4920-00-906-9732)	SC 4920-99-CL-A52
Shop set, aircraft maintenance, airmobile, flaw detection, direct support maintenance, Battalion set No. 6 (NSN 4920-00-906-9733)	SC 4920-99-CL-A53
Shop set, aircraft maintenance, airmobile, company size, direct support, CH-47 (NSN 4920-00-133-8157)	SC 4920-99-CL-A89
Shop set aircraft maintenance, airmobile, company size, direct support, CH-47/OH-6 (NSN 4920-00-133-8156)	SC 4920-99-CL-A89
Shop set, aircraft maintenance, airmobile, company size, direct support, UH-1 (NSN 4920-00-133-8154)	SC 4920-99-CL-A89
Shop set, aircraft maintenance, airmobile, company size, direct support, UH-1/OH-6 (NSN 4920-00-133-8158)	SC 4920-99-CL-A89

2-39. Shop Sets (Cont).

NOMENCLATURE	SM/SC
Shop Set, Aviation Intermediate Maintenance: electrical, instrument, airmobile (NSN 4920-00-165-1453)	SC 4920-99-CL-A91
Shop Set, Aviation Intermediate Maintenance: hydraulic, airmobile (NSN 4920-00-165-1454)	SC 4920-99-CL-A91
Shop Set, Aviation Intermediate Maintenance: machine shop, airmobile (NSN 4920-00-405-9279)	SC 4920-99-CL-A91
Shop Set, Aviation Intermediate Maintenance: power train, airmobile (NSN 4920-00-001-4132)	SC 4920-99-CL-A91
Shop Set, Aviation Intermediate Maintenance: rotor, airmobile (NSN 4920-00-405-9270)	SC 4920-99-CL-A91
Shop Set, Aviation Intermediate Maintenance: sheet metal, airmobile (NSN 4920-00-166-5505)	SC 4920-99-CL-A91
Shop Set, Aviation Intermediate Maintenance: tool crib, airmobile (NSN 4920-00-472-4183)	SC 4920-99-CL-A91
Shop Set, Aviation Intermediate Maintenance: turbine engine, airmobile (NSN 4920-00-224-3684)	SC 4920-99-CL-A91
Shop Set, Aviation Intermediate Maintenance: welding, airmobile (NSN 4920-00-163-5093)	SC 4920-99-CL-A91

2-40. Tool Kits.

NOMENCLATURE	SM/SC
Tool kit, aircraft mechanic's, general (NSN 5180-00-323-4692)	SC 5180-99-CL-A01
Tool kit, airframe repairer: Army aircraft (NSN 5180-00-323-4876)	SC 5180-99-CL-A02
Tool kit, hydraulic repairman's, Army aircraft (NSN 5180-00-323-4891)	SC 5180-99-CL-A03
Tool kit, propeller and rotor repairman's, Army aircraft (NSN 5180-00-323-4909)	SC 5180-99-CL-A05
Tool kit, instrument repairman's, Army aircraft (NSN 5180-00-323-4913)	SC 5180-99-CL-A06
Tool kit, electrical repairman's, Army aircraft (NSN 5180-00-323-4915)	SC 5180-99-CL-A07
Tool kit, power plant: Army aircraft (NSN 5180-00-323-4944)	SC 5180-99-CL-A09
Tool kit, aircraft inspection, technical (NSN 5180-00-323-5114)	SC 5180-99-CL-A10
Tool kit, trainer, flight simulator, set No. 1 (NSN 5180-00-859-0556)	SC 5180-99-CL-A11
Tool kit, Army aircraft, crash investigation (NSN 5180-00-903-1049)	SC 5180-99-CL-A13
Tool kit, powertrain: Army aircraft (NSN 5180-00-003-5267)	

2-41. Tool Sets.

NOMENCLATURE	SM/SC
Tool Set, Aviation Unit Maintenance, Set No. 1: Airmobile (NSN 4920-00-159-8727)	SC 4920-99-CL-A90
Tool Set, Aviation Unit Maintenance, Set No. 1: Fixed Base (NSN 4920-00-504-9258)	SC 4920-99-CL-A90
Tool Set, Aviation Unit Maintenance, Reciprocating Engine Supplement (NSN 4920-00-159-8728)	SC 4920-99-CL-A92
Tool Set, Aviation Unit Maintenance: company size, Set No. 2, airmobile (NSN 4920-00-567-0476)	

Section V. INSPECTIONS

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2-42. Aircraft Inspections.

This section is under a complete revision. Data will not be available until the 2nd quarter, FY 79. This data will be included in the next update to FM 101-20 in February 1980. Until this data is available, continue to use the inspection criteria in the Technical Publications listed in Chapter 1, Section IV, Standard Aircraft Characteristics.

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Source: DRSTS-MEN

Section VI. FUEL AND OIL

2-43. Fuel and Oil Costs. (FY 78)

TYPE AIRCRAFT	FUEL		OIL	
	GRADE <u>1</u> /	COST PER GAL <u>2</u> /	MIL-L- SPECIFI- CATION <u>1</u> /	COST PER QT <u>3</u> /
AH-1G/S	JP4/5	.436/.456	7808/23699	2.26
CH-47A	JP4	.436	23699	2.26
CH-47B	JP4/5	.436/.456	23699	2.26
CH-47C/D . . .	JP4/5	.436/.456	23699	2.26
CH-54A	JP4/5	.436/.456	23699	2.26
CH-54B	JP4/5	.436/.456	23699	2.26
OH-6A	JP4/5	.436	23699	2.26
OH-58A/C . . .	JP4		23699	2.26
UH-1B/C	JP4/5	.436/.456	23699	2.26
UH-1D	JP4/5	.436/.456	23699	2.26
UH-1H/M/V . .	JP4	.436	23699	2.26
EH-1H/EH-1X				
TH-55A	115/145	.590	22851	.67
U-8D/RU-8D	115/145	.590	22851	.67
U-8F	115/145	.590	22851	.67
U-8G	115/145	.590	22851	.67
U-10A	115/145	.590	22851	.67
U-21A	JP4/5	.436/.456	23699	2.26
RU-21A	JP4/5	.436/.456	23699	2.26
RU-21B	JP4/5	.436/.456	23699	2.26
RU-21C	JP4/5	.436/.456	23699	2.26

2-43. Fuel and Oil Costs (Cont).

TYPE AIRCRAFT	FUEL		OIL	
	GRADE <u>1/</u>	COST PER GAL <u>2/</u>	MIL-L- SPECIFI- CATION <u>1/</u>	COST PER QT <u>3/</u>
RU-21D	JP-4/5	.436/.456	23699	2.26
U-21G	JP-4/5	.436/.456	23699	2.26
RU-21E	JP-4/5	.436/.456	23699	2.26
U-21F	JP-4/5	.436/.456	23699	2.26
RU-21J	JP-4/5	.436/.456	23699	2.26
RU-21H.....	JP-4/5	.436/.456	23699	2.26
OV-1B	JP-4/5	.436/.456	23699	2.26
OV-1C (w/L -15)	JP-4/5	.436/.456	23699	2.26
OV-1D	JP-4/5	.436/.456	23699	2.26
T-41B	115/145	.590	26851	.83
T-42A	115/145	.590	None	.83
C-12A	JP-4/5	.436/.456	23699	2.26
UV-18A	JP-4/5	.436/.456	23699	2.26
UH-60A	JP-4/5	.436/.456	23699	2.26
YAH-64A	JP-4/5	.436/.456	23699	2.26

DATA SOURCE: 1/ TB 55-9150-200-25, Engine and Transmission Oils, Fuels, and Additives for Army Aircraft.

2/ DFSC Price Bulletin No. 78-1 Standard Prices of Bulk Petroleum Items.

3/ Federal Supply Catalog, C-ML-A, Army Management Data List, and Defense General Supply Center.

Note: The above costs are subject to frequent change and should be used for planning only. Next change will be Oct 1978.

Source: STSGP-FM
AV 977-7247

2-44. Fuel and Oil Consumption.

TYPE OF AIRCRAFT	NUMBER OF ENGINES	ENGINE MODEL	DESIGN POWER PER ENGINE (SHP)			DRIVE TRAIN LIMIT SHP	FUEL CONSUMPTION GAL PER AIRCRAFT HR			OIL CONSUMPTION QTS PER AIRCRAFT HR
			MAXIMUM	NORMAL	CRUISE ¹		MAXIMUM	NORMAL	CRUISE	
AH-1S	1	T53-L-703	1800	1400	1050	1290 ³	1092 ⁴	109.2 ⁴	100.8 ⁴	0.56
AH-1G/S	1	T53-L-13B	1400	1250	937.5	1100	101.5 ⁵	101.5 ⁵	93.1 ⁵	0.56
CH-47A	2	T55-L-7	2650	2200	1650.0	5200	482.0	407.8	305.9	1.60
CH-47B	2	T55-L-7C	2850	2400	1800.0	5200	478.8	442.0	331.5	1.60
CH-47C	2	T55-L-11A	3750	3000	2250.0	6000	497.1	497.1	372.8	1.60
CH-54A	2	T73-P-1	4500	4000	3000.0	5400	656.7	656.7	555.2 ²	1.04
CH-54B	2	T73-P-700	4800	4430	3322.5	6600	716.4	716.4	597.1 ²	1.04
OH-6A	1	T63-A-5A/700	317	270	202.5	250	29.0	29.0	17.6	0.20
OH-58A/C	1	T63-700	317	270	202.5	317	33.7	29.1	23.6	0.20
UH-1B/C	1	T53-L-11D	1100	900	675.0	1100	114.5	96.5	78.5	0.56
UH-1D	1	T53-L-11D	1100	900	675.0	1100	114.5	96.5	78.5	0.56
UH-1H/M/V	1	T53-L-13B	1400	1250	937.5	1100	106.0	106.0	93.1	0.56
EH-1H/EH-1X										
U-21A	2	T74-CP-700	550	495	371.3		115.4	107.0	80.2	0.20
RU-21A	2	T74-CP-700	550	495	371.3		115.4	107.0	80.2	0.20
RU-21B	2	T74-CP-702	750	688	516.0	620	117.1	117.1	97.5	0.20
RU-21C	2	T74-CP-702	750	688	516.0	620	117.1	117.1	97.5	0.20
RU-21D	2	T74-CP-700	550	495	371.3		115.4	107.0	80.2	0.20
U-21G	2	T74-CP-700	550	495	371.3		115.4	107.0	80.2	0.20
RU-21H	2	T74-CP-700	550	495	371.3		115.4	107.0	80.2	0.20
U-21F	2	PT6A-28	680	620	465.0		128.1	117.1	89.1	0.20
OV-1B	2	T53-L-7	1100	900	675.0		225.0	190.1	139.2	1.12
OV-1C	2	T53-L-15	1150	1000	750.0		219.6	198.5	148.5	1.12
OV-1D	2	T53-L-701	1400	1250	937.5		252.2	232.8	174.6	1.12

¹/ Cruise = 75% Normal²/ Based on 75%³/ 30 Min.⁴/ Eight Tow Missiles⁵/ Hog Mission

Drive Train Limit

2,000 Ft. Pressure Altitude

2,000 Ft. Pressure Altitude

9,000 Lbs. Gross Weight

9,000 Lbs. Gross Weight

2-44. Fuel and Oil Consumption (Cont).

TYPE OF AIRCRAFT	NUMBER OF ENGINES	ENGINE MODEL	DESIGN			FUEL CONSUMPTION			OIL CONSUMPTION QTS PER AIRCRAFT HR
			POWER PER ENGINE (BHP)			GAL PER AIRCRAFT HR			
			MAXIMUM	NORMAL	CRUISE ¹	MAXIMUM	NORMAL	CRUISE	
TH-55	1	H10-360-B1A	180	160	120.0	15.1	13.4	10.1	0.17
U-8D/RU-8D	2	O-480-1B	340	320	240.0	57.0	53.6	40.2	0.50
U-8F	2	O-480-3A	340	320	240.0	60.5	56.8	42.6	0.50
U-8G	2	O-480-1B	340	320	240.0	57.0	53.6	40.2	0.50
U-10A	1	GO-480-G1D6	340	320	240.0	30.2	28.4	20.1	0.25
T-41B	1	IO-360-D	210	210	157.5	15.5	15.5	11.6	0.25
T-42A	2	IO-470-L	260	260	195.0	39.2	39.2	29.4	0.50
C-12A	2	PT-6-38	2/ 750	—	—	115.4	107.0	80.2	0.20
UV-18A	2	—	—	—	—	—	—	—	—
UH-60A	2	GE700T-700	2/ 920	—	750.0	—	—	—	—

NOTE: Aircraft in development or type classified contingency not included

YAH-64A	2	GE700T-700	920	—	750.0	—	—	—	—
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¹/ Cruise = 75% Normal

²/ Shaft Horsepower

Source: DARCOM PM'S
TSARCOM RPO'S and PM'S

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Section VII. MAINTENANCE MAN-HOURS

2-45. Total Direct Maintenance Man-Hours per Flight Hour (Combat).

TYPE AIRCRAFT	AVIATION UNIT MAINTENANCE (AVUM) <u>1/</u>	AVIATION INTERMEDIATE MAINTENANCE (AVIM) <u>2/</u>	TOTAL
AH-1G/S	4.05	1.38	5.43
CH-47A	13.80	5.35	19.15
CH-47B	12.48	4.26	16.74
CH-47C	13.46	6.10	19.56
CH-54	16.21	3.89	20.10
OH-6A	2.84	1.01	3.85
OH-58A/C	2.84	1.01	3.85
UH-1B/C/M	3.61	1.47	5.08
UH-1D/H	3.38	1.28	4.66
OV-1C/D	5.16	1.40	6.56
T-41B	2.93	1.78	4.71
OV-1C	5.34	1.56	6.90
U-21/RU21	4.02	1.11	5.13
UH-60A	2.27	0.94	3.21

1/ AVUM is that organizational and integrated Direct Support Maintenance performed in company sized aviation units.

2/ AVIM is the amalgamation of direct and general support aviation maintenance units into a single maintenance unit performing both direct and general support aircraft maintenance.

NOTE: The above factors are direct man-hours only and are based on TOE Manpower Authorization Criteria (MACRIT).

Avionics and weapons systems are not included.

REFERENCE: AR 570-2 w/change 10

Source: DRSTS-MPM

2-46. Manpower Authorization Criteria (MACRIT).

**AIRCRAFT MAINTENANCE AND
TECHNICAL INSPECTION OPERATIONS
(MOS 67/68 SERIES)**

**AIRCRAFT MAINTENANCE AND
TECHNICAL INSPECTION OPERATION
(MOS 67/68 SERIES)**

1. Productive man-Hours. Ref AR570-2

2. Authorization formula and criteria.

a. Aviation Unit Maintenance (AVUM).

(1) Density of Aircraft MACRIT Factor Number Positions
by Type X by MOS = Authorized
(1 to 9 Aircraft Category I) USE TABLE I ONLY - MOS 67 Series

(2) Density of Aircraft MACRIT Factor Number Positions
by Type X by MOS = Authorized
(10 or more aircraft Category I) USE TABLES I AND Ia - MOS 67/68 Series

(3) Density of Aircraft MACRIT Factor Number Positions
by Type X by MOS = Authorized
(1 to 9 Aircraft Category II) USE TABLE II ONLY - MOS 67 Series

(4) Density of Aircraft MACRIT Factor Number Positions
by Type X by MOS = Authorized
(10 or more Aircraft Category II) USE TABLES II AND IIa - MOS 67/68 Series

b. Aviation Intermediate Maintenance (AVIM).

Density of Aircraft MACRIT Factor Number Positions
by Type X by MOS = Authorized
(Table III Category II) (MOS 67 and 68 Series)

3. For force developers who utilize Annual Available Productive Man-hour (AAPMH) other than those listed in paragraph 2-7b(3). AR570-2 and/or Flying Hours as listed in Table IV. Column A below, substitute appropriate AAPMH and/or Flying Hours requirements in the following authorization formulae and criteria.

a. Aircraft Repairer (with FLYING CREWCHIEF) (MOS 67 Series).

STEP 1:	Maintenance man-hours/ flight hour (Table V)	X	Annual flying hours (Table IV) or other source 2	-	.50 Annual Available 1 productive man-hours by category or other source 3	÷	Annual Available productive man-hours by category or other source 3	=	MACRIT Factor by MOS
STEP 2:	Density of Aircraft by Type	X	MACRIT Factor (From Step 1 above)	=	Number Positions plus Number Positions plus one Crewchief per Aircraft				

b. AVUM: Aircraft Repairer without crewchiefs (MOS 67 Series).⁵

Density of Aircraft by Type	X	Maintenance man-hours/flight hour (Table V)	X	Annual flying hours (Table IV) ₂ or other source ²	÷	Annual Available productive man-hours by category or other source ³	=	Number Positions Authorized
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c. AVUM: Aircraft Component Repairer (MOS 68 Series).

Density ⁴ of Aircraft by type	X	Maintenance man-hours/flight hour (Table VI)	X	Annual flying hours (Table IV) ₂ or other source ²	÷	Annual Available productive man-hours by category or other source ³	=	Number Positions Authorized
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d. AVIM: Aircraft & Aircraft Component Repair (MOS 67 & 68 Series).

Density of Aircraft by type	X	Maintenance man-hours/flight hour (Table VI)	X	Annual flying hours (Table IV) ₂ or other source ²	÷	Annual Available productive man-hours by category or other source ³	=	Number Positions Authorized
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e. TECHNICAL INSPECTORS: (MOS 67 Series only).

Density of Aircraft by type	X	Maintenance man-hours/flight hour (Table VII)	X	Annual flying hours (Table IV) ₂ or other source ²	÷	Annual Available productive man-hours by category or other source ³	=	Number Positions Authorized
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- NOTE 1: Flying crewchiefs are 35 percent productive directive/non-flying crewchiefs are 50 percent projective direct
- NOTE 2: Use the flying hours listed in Table IV (Column B) or those documented flight hours necessary to accomplish the mission.
- NOTE 3: Substitutions may be made when the AAPMH figures vary from those listed in paragraph 2-7b(3), AR570-2
- NOTE 4: Only those units with 10 or more aircraft will be authorized MOS 68 Series.
- NOTE 5: Aircraft OV-1B/C/D, UH-21A, OH-6A, OH-58A, and AH-1G/S are not authorized flying crew chief. Nonflying crew chief's positions may be designated from within the authorized position computation.

SAMPLE COMPUTATIONS (For units flying hours and/or AAPMH other than those in this regulation, see paragraph 3 above).

1. AVUM: Aircraft Repairer (with FLYING CREWCHIEF) (MOS 67 Series).

ASSUME 13 UH-1H, annual flying hours = 100; and 2300 AAPMH.

STEP 1:	Maintenance man-hours/flight hour (Table V)	X	Annual flying hours (Table IV) ₂ or other source ²	-	.50 Annual Available productive man-hours by category or other source ³	÷	Annual Available productive man-hours by category or other source ³ FACTOR
	4.12	X	1000	-	1150	÷	2300 = 1.29
STEP 2:	Density of Aircraft by Type	X	MACRIT Factor by MOS	=	Number Positions	+ One Crewchief per Aircraft	= Total (67N) Positions Authorized
	13	X	1.29	=	16.77	+ 13	= 29.97 or 30

2. AVUM: Aircraft Repairer (without crewchief) (MOS 67 Series).

ASSUME 17 AH-1S, annual flying hours = 500 and 2600 AAPMH.

Density of Aircraft by type	X	Maintenance man-hours/flight hour (Table V)	X	Annual flying hours (Table IV) ₂ or other source ²	÷	Annual Available productive man-hours by category or other source ³	=	Number (67Y) Positions Authorized
17	X	4.93	X	500	÷	2600	=	16.11 or 16

3. Aircraft Component Repairer Computation for AVIM and AVUM (with 10 or more aircraft) are the same as SAMPLE COMPUTATION 2, above.

MACRIT FACTORS²

AVIATION UNIT MAINTENANCE (AVUM)

TABLE I (MOS 67 SERIES)
Category I Unit (2500 AAPMH)

LIN	A30221	A30271 A30296	A30946	K31749 ¹ K31767 K31804	K31786 ¹ K31795	K30376 ¹	K30383 ¹	K30449 ¹	K30645	K31042	K30515 ¹ K30516	K29660 K29694
AIRCRAFT	OV-1B	OV-1C/D	U-21A	UH-1B/C/M	UH-1D/H	CH-47A	CH-47B	CH-47C	OH-6A	OH-58A	CH-54A/BAH-1G/S	
AIRPLANE REPAIRER (67G)	1.75	1.85	1.76									
UTILITY HELICOPTER REPAIRER (67N)				1.85	2.06							
MEDIUM CARGO HELICOPTER REPAIRER (67U)						5.17	4.78	4.96				
OBSERVATION HELICOPTER REPAIRER (67V)									1.06	1.05		
HEAVY CARGO HELICOPTER REPAIRER (67X)											4.61	
ATTACK HELICOPTER REPAIRER (67Y)												1.54
AIRPLANE INSPECTOR (67G)	.21	.21	.16									
UTILITY HELICOPTER INSPECTOR (67N)				17	27							
MEDIUM CARGO HELICOPTER INSPECTOR (67U)						.79	.79	.79				
OBSERVATION HELICOPTER INSPECTOR (67V)									16	.16		
HEAVY CARGO HELICOPTER INSPECTOR (67X)											.64	
ATTACK HELICOPTER INSPECTOR (67Y)												.20

NOTE 1: INCLUDES ONE FLYING CREWCHIEF PER AIRCRAFT.

NOTE 2: IN UNITS WITH 10 OR MORE AIRCRAFT, FOR POSITIONS NOT JUSTIFIED BY MACRIT BUT ESSENTIAL FOR THE OPERATION OF THE UNIT, A TRADE-OFF IS AUTHORIZED AS LONG AS TOTAL AUTHORIZATION FOR POSITIONS IS NOT EXCEEDED.

TABLE Ia (MOS 68 SERIES)
Category I Unit (2500 AAPMH)

	06	.04 .02	.05 .07	.11 .10	.11 .05	.03 .09	.07
AIRCRAFT POWERPLANT REPAIRER (68B)	.06	.04 .02	.05 .07	.11 .10	.11 .05	.03 .09	.07
AIRCRAFT POWERTRAIN REPAIRER (68D)	.02	.02 .02	.06 .05	.32 .24	.37 .06	.04 .10	.07
AIRCRAFT ELECTRICIAN (68F)	.04	.02 .04	.01 .02	.11 .10	.11 .03	.01 .09	.02
AIRCRAFT STRUCTURAL REPAIRER (68G)	.12	.12 .12	.05 .07	.11 .10	.16 .09	.16 .05	.05
AIRCRAFT PNEUDRAULICS REPAIRER (68H)	.02	.04 .02	.01 .02	.05 .04	.05 NONE	.01 .05	.02

MACRIT FACTORS²

AVIATION UNIT MAINTENANCE (AVUM)

TABLE II (MOS 67 SERIES)

Category II Unit (2700 AAPMH)

LIN	A30221	A30271 A30296	A30946	K31749 ¹ K31767 K31804	K31786 ¹ K31795	K30376 ¹	K30383 ¹	K30449 ¹	K30645	K31042	K30515 ¹ K30516	K29660 K29694
AIRCRAFT	OV-1B	OV-1C/D	U-21A	UH-1B/C/M	UH-1D/H	CH-47A	CH-47B	CH-47C	OH-6A	OH-58A	CH-54A/B	AH-1G/S
AIRPLANE REPAIRER (67G)	1.82	1.71	1.65									
UTILITY HELICOPTER REPAIRER (67N)				1.66	1.95							
MEDIUM CARGO HELICOPTER REPAIRER (67U)						4.82	4.48	4.63				
OBSERVATION HELICOPTER REPAIRER (67V)									1.00	1.00		
HEAVY CARGO HELICOPTER REPAIRER (67X)											4.49	
ATTACK HELICOPTER REPAIRER (67Y)												1.42
AIRPLANE INSPECTOR (67G)	.19	.19	.17									
UTILITY HELICOPTER INSPECTOR (67N)				.16	.25							
MEDIUM CARGO HELICOPTER INSPECTOR (67U)						.73	.73	.73				
OBSERVATION HELICOPTER INSPECTOR (67V)									.15	.15		
HEAVY CARGO HELICOPTER INSPECTOR (67X)											.59	
ATTACK HELICOPTER INSPECTOR (67Y)												.19

NOTE 1: INCLUDES ONE FLYING CREWCHIEF PER AIRCRAFT.

NOTE 2: IN UNITS WITH 10 OR MORE AIRCRAFT, FOR POSITIONS NOT JUSTIFIED BY MACRIT BUT ESSENTIAL FOR THE OPERATION OF THE UNIT, A TRADE-OFF IS AUTHORIZED AS LONG AS TOTAL AUTHORIZATION FOR POSITIONS IS NOT EXCEEDED.

TABLE IIa (MOS 68 SERIES)
Category II Unit (2700 AAPMH)

	.05	.04 .02	.05 .07	10 .09	10 .05	.03 .09	.06
AIRCRAFT POWERPLANT REPAIRER (68B)	.05	.04 .02	.05 .07	10 .09	10 .05	.03 .09	.06
AIRCRAFT POWERTRAIN REPAIRER (68D)	.02	.02 .02	.05 .05	30 .22	.34 .06	.04 .09	.07
AIRCRAFT ELECTRICIAN (68F)	.04	.02 .04	.01 .01	10 .09	.10 .03	.01 .09	.02
AIRCRAFT STRUCTURAL REPAIRER (68G)	.11	.12 .11	.05 .07	10 .09	.14 .06	.14 .04	.05
AIRCRAFT PNEUDRAULICS REPAIRER (68H)	.02	.04 .02	.01 .01	.05 .03	.05 NONE	.01 .04	.02

MACRIT FACTORS¹
AVIATION INTERMEDIATE MAINTENANCE (AVIM)

TABLE III
Category II Unit (2700 AAPMH)

LIN	A30221	A30271 A30296	A30946	K31749 K31767 K31804	K31786 K31795	K30378	K30383	K30449	K30645	K31042	K30515 K30516	K29660 K29694
AIRCRAFT	OV-1B	OV-1C/D	U-21A	UH-1B/C/M	UH-1D/H	CH-47A	CH-47B	CH-47C	OH-61	OH-58A	CH-54A/B	AH-1G/S
AIRPLANE REPAIRER (67G)	.26	.29	.27									
UTILITY HELICOPTER REPAIRER (67N)				.26	.32							
MEDIUM CARGO HELICOPTER REPAIRER (67U)						.99	.78	1.14				
OBSERVATION HELICOPTER REPAIRER (67V)									.24	.24		
HEAVY CARGO HELICOPTER REPAIRER (67X)											.54	
ATTACK HELICOPTER REPAIRER (67X)												.27
AIRCRAFT POWERPLANT REPAIRER (68B)	.05	.06	.04	.09	.10	.29	.25	.35	.03	.17	.10	.09
AIRCRAFT POWERTRAIN REPAIRER (68D)	.01	.01	.04	.05	.08	.27	.20	.29	.06	.03	.05	.06
AIRCRAFT ELECTRICIAN (68F)	.01	.01	.06	.01	.01	.12	.09	.09	.01	.01	.14	.02
AIRCRAFT STRUCTURAL REPAIRER (68G)	.17	.19	.10	.09	.11	.19	.16	.24	.08	.12	.13	.09
AIRCRAFT PNEUDRAULICS REPAIRER (68H)	.01	.01	.02	.01	.01	.06	.06	.09	None	.01	.08	.01

AIRPLANE INSPECTOR (67G)	.05	.05	.03									
UTILITY HELICOPTER INSPECTOR (67N)			.07	.07								
MEDIUM CARGO HELICOPTER INSPECTOR (67U)					.16	.16	.16					
OBSERVATION HELICOPTER INSPECTOR (67V)								.03	.03			
HEAVY CARGO HELICOPTER INSPECTOR (67X)										.10		
ATTACK HELICOPTER (67X)											.05	

NOTE 1: FOR POSITIONS NOT JUSTIFIED BY MACRIT, BUT ESSENTIAL FOR THE OPERATION OF THE UNIT, A TRADE-OFF IS AUTHORIZED AS LONG AS TOTAL AUTHORIZATION FOR POSITIONS IS NOT EXCEEDED.

TABLE IV
FLYING HOURS DA APPROVED FLYING HOUR FACTORS
COLUMN A

LIN	AIRCRAFT	TOE ACTIVE COMBAT ENVIRONMENT HOURS PER:		Column B INDIRECT SUPPORT AIRCRAFT HOUR PER:	
		MONTH	YEAR	MONTH	YEAR
K29660 K29694	AH-1G/S	65	780	---	---
K30376 K30363 K30499	CH-47A/B/C	56	696	25	300
K31749 D31767 K31804	UH-1B/C/M	55	660	25	300
K31766 K31795	UH-1D/H	79	948	25	300
K30515 K30516	CH-54A/B	43	516	25	300
K30645	OH-61	68	616	25	300
K31042	OH-58A	68	616	25	300
A30221 A30271 A30296	OV-1B/C/D	58	696	---	---
A30946	U-21A	74	686	35	420

NOTE: Indirect support flying hours, Column B above, are applicable to those units (excluding divisional units) that are not directly or totally relatable to combat operations. Applicable to MTOE when directed by the MACOM

2-47. Aviation Intermediate Maintenance (AVIM) Support Units.

UNIT		Productive Maintenance Man-Hours Per Year (Based on 2700 Hr Production/Man/Year)	
TOE 55-89	Transportation Aircraft Maintenance Company Combat Aviation Battalion Airborne Division (or) Infantry Division	91,800	Aircraft Component Repair
		141,700	Aircraft Repair
		97,200	Aircraft Missile Systems Repair
		32,400	Aircraft Weapons Systems Repair
		16,200	Avionics Repair
TOE 55-407	Transportation Aircraft Maintenance Company Transportation Aircraft Maintenance Battalion Airmobile Division	129,600	Aircraft Component Repair
		178,200	Aircraft Repair
		24,300	Aircraft Armament Repair
		10,800	Aircraft Fire Control Repair
		86,400	Avionics Repair
TOE 55-417	Transportation Aircraft Maintenance Company Support Battalion Air Cavalry Combat Brigade	170,100	Aircraft Component Repair
		243,000	Aircraft Repair
		54,000	Aircraft Fire Control Repair
		18,900	Avionics Repair
TOE 55-424	Transportation Aircraft Maintenance Company Combat Aviation Battalion Armored Division (or) Infantry Division (Mech)	75,600	Aircraft Component Repair
		110,700	Aircraft Repair
		91,800	Aircraft Missile System Repair
		16,200	Aircraft Weapons System Repair
		13,500	Avionics Repair
*TOE 55-457	Transportation Aircraft Direct Support Company	91,800	Aircraft Component Repair
		121,500	Aircraft Repair
		27,000	Aircraft Armament Repair
		16,200	Aircraft Fire Control Repair
		75,600	Avionics Repair
*TOE 55-458	Transportation Aircraft General Support Company	140,400	Aircraft Component Repair
		197,100	Aircraft Repair
		16,200	Aircraft Armament Repair
		8,100	Aircraft Fire Control Repair
		118,800	Avionics Repair
TOE 55-459	Transportation Aircraft Intermediate Maintenance Support Company	205,200	Aircraft Component Repair
		145,800	Aircraft Repair
		29,700	Aircraft Armament Repair
		18,900	Aircraft Fire Control Repair
		72,900	Avionics Repair
TOE 55-459	Heavy Helicopter (CH-54) Section (Augmentation)	8,100	Aircraft Component Repair
		16,200	Aircraft Repair
TOE 55-459	Fixed Wing (OV-1/U-21) Section (Augmentation)	16,200	Aircraft Component Repair
		24,300	Aircraft Repair

2-47. Aviation Intermediate Maintenance (AVIM) Support Units (Cont).

UNIT	Productive Maintenance Man-Hours Per Year (Based on 2700 Hr Production/Man/Year)
TOE 55-459 Heavy Helicopter Fixed Wing Avionics Section (Augmentation)	45,900 Avionics Repair

*To be replaced by TOE 55-459

Source: TSARCOM (DRSTS-SPME)

Section VIII. MAINTENANCE CATEGORIES

2-48. The Three Categories of Maintenance are:

a. Aviation Unit Maintenance (AVUM):

This level includes all of the original organizational maintenance tasks plus some of the prior direct support maintenance tasks. It is that maintenance which is organic to the operating unit.

b. Aviation Intermediate Maintenance (AVIM):

This level of maintenance combines the remaining portions of capability of the prior direct and general support maintenance, thereby establishing a single level of support between AVUM and the depot.

c. Aviation Overhaul Maintenance (Depot):

This level of maintenance provides for the repair/overhaul of materiel beyond the capability of AVUM/AVIM.

Reference AR 750-1.

NOTE: The three level maintenance concept replaces the previous four level maintenance categories of organization, direct support, general support and depot.

2-49. Installations with Capabilities to Perform Aviation Overhaul Maintenance.

Army Depot	Location	Type Acft
Corpus Christi	Corpus Christi, Texas	AH-1 Series UH-1 Series OH-58A/C
New Cumberland	Harrisburg, PA.	U-8 Series CH-47 Series CH-54A/B OH-1A OH-58A/C

NOTE: Aircraft not maintained at CCAD and NCAD are contractor supported with commercial manuals.

Source: DRSTS-MPP

OH-6A	AVUM	AVIM
67V	1,901.28	465.12
68B	89.76	65.28
68D	114.24	106.08
68F	48.96	24.48
68G	163.20	163.20
 OH-58A		
67V	1,876.80	465.11
68B	48.96	326.40
68D	73.44	48.96
68F	24.48	24.48
68G	277.44	236.64
68H	16.32	16.32
 UH-1B/C/M		
67N	2,046.00	495.00
68B	92.40	165.00
68D	99.00	105.60
68F	26.40	19.80
68G	92.40	171.60
68H	26.40	13.20
 UH-1D/H		
67N	2,787.12	616.20
68B	132.72	189.60
68D	94.80	151.68
68F	28.44	28.44
68G	132.72	218.04
68H	28.44	9.48
 OV-1B		
67G	3,125.04	508.08
68B	104.40	104.40
68D	41.72	13.92
68F	69.60	6.96
68G	215.76	334.08
68H	34.80	6.96
 OV-1C/D		
67G	3,306.00	556.80
68B	76.56	118.32
68D	34.80	13.92
68F	41.72	20.88
68G	222.72	361.92
68H	76.56	13.92

TECHNICAL INSPECTORS

AH-1G/S	AVUM	AVIM
67Y3	358.80	93.60
UH-1B/C/M		
67N3	310.20	132.00
UH-1D/H		
67N3	483.48	142.20
OH-6A		
67V3	285.60	65.28
OH-58A		
67V3	285.60	65.28
CH-47A/B/C		
67U3	1,412.88	313.20
CH-54A/B		
67X3	1,135.20	196.08
U-21		
67G3	328.56	53.28
OV-1B/C/D		
67G3	368.88	97.44

OH-6A(67V)

$$\text{CAT I } 1,901.28 \times 1.4 = 2,661.79 \div 2,500 = 1.06$$

$$\text{CAT II } 1,901.28 \times 1.4 = 2,661.79 \div 2,700 = .99$$

OH-58A (67V)

$$\text{CAT I } 1,876.78 \times 1.4 = 2,627.52 \div 2,500 = 1.05$$

$$\text{CAT II } 1,876.78 \times 1.4 = 2,627.52 \div 2,700 = .97$$

UH-1D/H

w/flying crew chief

$$\text{CAT I } 2,787.12 \times 1.4 = 3,901.97 - 1,250 = 2,651.97 \div 2,500 = 1.06 + 1 = 2.06$$

$$\text{CAT II } 2,787.12 \times 1.4 = 3,901.97 - 1,350 = 2,551.97 \div 2,700 = .95 + 1 = 1.95$$

UH-1B/C/M

w/ flying crew chief

$$\text{CAT I } 2,046.0 \times 1.4 = 2,864.4 - 1,250 = 1,614.4 \div 2,500 = .65 + 1 = 1.65$$

$$\text{CAT II } 2,046.0 \times 1.4 = 2,864.4 - 1,350 = 1,514.4 \div 2,700 = .56 + 1 = 1.56$$

OV-1B (67G)

$$\text{CAT I } 3,125.05 \times 1.4 = 4,375.06 \div 2,500 = 1.75$$

$$\text{CAT II } 3,125.04 \times 1.4 = 4,375.06 \div 2,700 = 1.62$$

OV-1C/D (67G)

$$\text{CAT I } 3,306.0 \times 1.4 = 4,628.4 \div 2,500 = 1.85$$

$$\text{CAT II } 3,306.0 \times 1.4 = 4,628.4 \div 2,700 = 1.71$$

U-21 (67G)

$$\text{CAT I } 3,179.04 \times 1.4 = 4,450.66 \div 2,500 = 1.78$$

$$\text{CAT II } 3,179.04 \times 1.4 = 4,450.66 \div 2,700 = 1.65$$

2,500

2,700

OH-58A

68B	48.96 X 1.4 = 68.54 ÷	.03	.03
68D	73.44 X 1.4 = 102.82 ÷	.04	.04
68F	24.48 X 1.4 = 34.27 ÷	.01	.01
68G	277.44 X 1.4 = 388.42 ÷	.16	.14
68H	16.32 X 1.4 = 22.85 ÷	.01	.01

UH-1B/C/M

68B	92.40 X 1.4 = 129.36 ÷	.05	.05
68D	99.00 X 1.4 = 138.60 ÷	.06	.05
68F	26.40 X 1.4 = 36.96 ÷	.01	.01
68G	92.40 X 1.4 = 129.36 ÷	.05	.05
68H	26.40 X 1.4 = 36.96 ÷	.01	.01

UH-1D/H

68B	132.72 X 1.4 = 185.81 ÷	.07	.07
68D	94.80 X 1.4 = 132.72 ÷	.05	.05
68F	28.44 X 1.4 = 39.82 ÷	.02	.01
68G	132.72 X 1.4 = 185.81 ÷	.07	.07
68H	28.44 X 1.4 = 39.82 ÷	.02	.01

OV-1B

68B	104.40 X 1.4 = 146.16 ÷	.06	.05
68D	41.72 X 1.4 = 58.41 ÷	.02	.02
68F	69.60 X 1.4 = 97.44 ÷	.04	.04
68G	215.76 X 1.4 = 302.06 ÷	.12	.11
68H	34.80 X 1.4 = 48.72 ÷	.02	.02

OV-1C/D

68B	76.56 X 1.4 = 107.18 ÷	.04	.04
68D	34.80 X 1.4 = 48.72 ÷	.02	.02
68F	41.72 X 1.4 = 58.41 ÷	.02	.02
68G	222.72 X 1.4 = 311.81 ÷	.12	.12
68H	76.56 X 1.4 = 107.18 ÷	.04	.04

U-21A

68B	35.52 X 1.4 = 49.73 ÷	.02	.02
68D	35.52 X 1.4 = 49.73 ÷	.02	.02
68F	71.04 X 1.4 = 99.46 ÷	.04	.04
68G	213.12 X 1.4 = 298.37 ÷	.12	.11
68H	35.52 X 1.4 = 49.73 ÷	.02	.02

AVUM TI's

		2,500	2,700
	AH-1G/S		
67Y3	$358.80 \times 1.40 = 502.32 \div$	.20	.19
	UH-1B/C/M		
67N3	$310.20 \times 1.40 = 434.28 \div$	.17	.16
	UH-1D/H		
67N3	$483.48 \times 1.40 = 676.87 \div$	.27	.25
	OH-6A		
67V3	$285.60 \times 1.40 = 399.84 \div$	.16	.15
	OH-58A		
67V3	$285.60 \times 1.40 = 399.84 \div$	.16	.15
	CH-47A/B/C		
67U3	$1,412.88 \times 14.0 = 1,978.03 \div$	.79	.73
	CH-54A/B		
67X3	$1,135.20 \times 1.40 = 1,589.28 \div$	.64	.59
	U-21		
67G3	$328.56 \times 1.40 = 459.98 \div$	.18	.17
	OV-1B/C/D		
67G3	$368.88 \times 1.40 = 516.43 \div$	.21	.19

2,700

OH-6A

67V	$465.12 \times 1.4 = 651.17 \div$	.24
68B	$65.28 \times 1.4 = 91.39 \div$	.03
68D	$106.08 \times 1.4 = 148.51 \div$	.06
68F	$24.48 \times 1.4 = 34.27 \div$	.01
68G	$163.20 \times 1.4 = 228.48 \div$	.08

OH-58A

67V	$465.11 \times 1.4 = 651.15 \div$	.24
68B	$326.40 \times 1.4 = 456.96 \div$	.17
68D	$48.96 \times 1.4 = 68.54 \div$	.03
68F	$24.48 \times 1.4 = 34.27 \div$	.01
68G	$236.64 \times 1.4 = 331.30 \div$	.12
68H	$16.32 \times 1.4 = 22.85 \div$	.01

UH-1B/C/M

67N	$495.00 \times 1.4 = 693.00 \div$	.26
68B	$165.00 \times 1.4 = 231.00 \div$	.09
68D	$105.60 \times 1.4 = 147.84 \div$	.05
68F	$19.80 \times 1.4 = 27.72 \div$	.01
68G	$171.60 \times 1.4 = 240.24 \div$	.09
68H	$13.20 \times 1.4 = 18.48 \div$	.01

UH-1D/H

67N	$616.20 \times 1.4 = 862.68 \div$	.32
68B	$189.60 \times 1.4 = 265.44 \div$	.10
68D	$151.68 \times 1.4 = 212.35 \div$	.08
68F	$28.44 \times 1.4 = 39.82 \div$	.01
68G	$218.04 \times 1.4 = 305.26 \div$	.11
68H	$9.48 \times 1.4 = 13.27 \div$	.01

OV-1B

67G	$508.08 \times 1.4 = 711.31 \div$	.26
68B	$104.40 \times 1.4 = 146.16 \div$	.05
68D	$13.92 \times 1.4 = 19.49 \div$	.01
68F	$6.96 \times 1.4 = 9.74 \div$	.01
68G	$334.08 \times 1.4 = 467.71 \div$	.17
68H	$6.96 \times 1.4 = 9.74 \div$	.01

AVIM TI'S

	AH-1G/S	2,700
67Y3	93.60 x 1.40 = 131.04 ÷ UH-1B/C/M	.05
67N3	132.00 x 1.40 = 184.80 ÷ UH-1D/H	.07
67N3	142.20 x 1.40 = 199.08 ÷ OH-6A	.07
67V3	65.28 x 1.40 = 91.39 ÷ OH-58A	.03
67V3	65.28 x 1.40 = 91.39 ÷ CH-47A/B/C	.03
67U3	313.20 x 1.40 = 434.48 ÷ CH-54A/B	.16
67X3	196.08 x 1.40 = 274.51 ÷ U-21	.10
67G3	53.28 x 1.40 = 74.59 ÷ OV-1B/C/D	.03
67G3	97.44 x 1.40 = 136.42 ÷	.05

CHAPTER 3

PERSONNEL REQUIREMENTS

Section I. OFFICER/WARRANT OFFICER AVIATION PERSONNEL REQUIREMENTS

3-1. Officer/Warrant Officer Requirements.

AR 570-1 contains criteria for, and lists positions where commissioned officers are authorized. Under these criteria, positions entailing essential command, staff, or supervisory functions for which an officer is especially required are so designated. All other positions are designated as warrant officer.

units will be manned with pilots and copilots to give the unit a sustained operational capability. Dual control aircraft assigned in certain indirect support categories may not require copilots unless flight must be performed under instrument conditions.

3-2. Cockpit Seat Fill Requirements.

Cockpit seat-fill requirements vary with the type of aircraft and the mission of the unit. At least the minimum crew complement prescribed in the operations handbook for a particular aircraft is authorized except for proficiency, contractor operated, and maintenance float aircraft for which no Army aviators are programmed. In general, dual control aircraft in combat, combat support units, and indirect support

Section II. ENLISTED AVIATION MAINTENANCE PERSONNEL REQUIREMENTS

3-3. Enlisted Personnel Requirements.

a. AR570-2 provides staff officers and aircraft maintenance officers with uniform guidance to accomplish the following:

(1) Evaluate manpower requirements for TOE/TD units as pertains to user and support maintenance activities.

(2) Determine manpower requirements in connection with procurement of aircraft maintenance services.

b. A relationship exists between the flying hours accumulated on aircraft and the man-hours of maintenance

required for its continued serviceability. The relationship is termed man-hour per flight-hour ratio (MH/FH) and prevails in both user and support level maintenance. The ratio varies by type and model of aircraft, depending on aircraft size and complexity.

3-4. Enlisted MOS Applicable to Aircraft Types.

Current MOS	Description	Category		Aircraft Applicable
		AVUM	AVIM	
26E	Aerial Surveillance Sensor Repairer		X	OV-1D
26K	Aerial Electronic Warning/Defense Equipment Repairer	X	X	A11
26M	Aerial Surveillance Radar Repairer		X	OV-1B
26N	Aerial Surveillance Infrared Repairer		X	OV-1C
35K	Avionic Mechanic	X	X	A11
35L	Avionic Communications Equipment Repairer		X	A11
35M	Avionic Navigation and Flight Control Equipment Repairer		X	A11
35P	Avionic Equipment Maintenance Supervisor		X	A11
35R	Avionic Special Equipment Repairer		X	A11
41G	Aerial Surveillance Photographic Equipment Repairer		X	OV-1B/C
67G	Airplane Repairer	X	X	U-8, U-21, OV-1 (series)
67N	Utility Helicopter Repairer	X	X	UH-1 (series)
67T	Tactical Transport Helicopter Repairer	X	X	UH-60A
67U	Medium Helicopter Repairer	X	X	CH-47 (series)
67V	Observation/Scout Helicopter Repairer	X	X	OH-6A, OH-58 (series)
67W	Aircraft Quality Control Supervisor	X	X	A11
67X	Heavy Lift Helicopter Repairer	X	X	CH-54 (series)
67Y	Attack Helicopter Repairer	X	X	AH-1 (series)
67Z	Aircraft Maintenance Senior Sergeant	X	X	A11
68B	Aircraft Powerplant Repairer	X	X	A11
68D	Aircraft Powertrain Repairer	X	X	A11
68F	Aircraft Electrician	X	X	A11
68G	Aircraft Structural Repairer	X	X	A11
68H	Aircraft Pneudraulics Repairer	X	X	A11
68J	Helicopter Missile Systems Repairer	X	X	A11 RW
68K	Aircraft Component Repair Supervisor		X	A11
68M	Helicopter Weapon Systems Repairer	X	X	A11 RW

REFERENCE: CMF 28 and 67, AR 611-201.

- NOTE:
1. MOS 67G has been tentatively identified as the Remotely Piloted Vehicle Repairer.
 2. Contract maintenance is utilized to support the C-12A, however, MOS 67G may be utilized as a flying crew chief.
 3. MOS 67Y is currently being utilized for planning purposes during Phase II of the YAH-64A development program. Determination will be made at the end of Phase II relative to the need for the AH-64A.

Source: DRDAV-EON(2)



Section I. ARMY AIRCRAFT DIRECT COSTS PER FLYING HOUR (FY 78)

4-1. Costs Per Flying Hour (Standard Rate Cost Comparison - Army Administrative Versus Commercial).

Type Aircraft	Field OMA Parts	POL	Civilian ¹ Field Labor	Crewmen ² Hourly Per Diem	Cost ³ Comparison Rates		Reimbursement Rates For DOD & Non-DOD Users	
					APA Spares and Depot Costs	Hourly Rate		
Fixed Wing								
C-12A	52	47	79	22	14	214	270	322
OV-1D	117	85	54	15	78	348	452	578
RU-21	43	50	41	22	21	177	229	347
T-42	33	26	41	15	9	124	146	254
U-8F	33	28	41	22	9	133	155	278
U-21A/G	34	50	37	22	20	163	212	313
U-21F	34	55	37	22	23	166	208	309
Rotary Wing								
AH-1G	155 ¹⁶⁵	49 ⁵⁷	75 ⁸⁶	15 ¹⁵	51	345	419 ⁵⁷	709 ⁸⁷⁰
AH-1S	215 ²¹¹	51 ⁵⁷	95	15	93	469	550	901
CH-47A	318	148	97	29	335	937	1164	2036
CH-47B	318	158	95	29	345	945	1172	2046
CH-47C	318	198	88	29	345	978	1205	2081
CH-54A	336	180	116	29	501	1102	1430	2349
CH-54B	336	170	116	29	441	1092	1420	2338
OH-6A	38	9	20	15	20	102	126	294
OH-58A	38	11	19	15	26	107	132	301
UH-1H	59	45	28	22	38	192	257	508

CHAPTER 4
COSTS

4-1. Costs Per Flying Hour (Standard Rate Cost Comparison - Army Administrative Versus Commercial (cont)).

- 1/ If maintenance is performed by military personnel, or shared with civilian labor, civilian field labor rates should be prorated.
- 2/ Intra-Army rates have been revised by adding an hourly per diem factor for crewmen.
- 3/ Cost comparison rates to be utilized for Army administrative air versus commercial air travel justification as required by AR 310-34 and AR 95-1. These rates include civilian labor, crewmen per diem plus APA replenishment spares and depot overhaul costs.

NOTE: Major commands have the authority to reprogram these rates when the situation dictates, i.e., due to contract maintenance, geographical location or special missions. When this situation occurs and it is determined that MACOM flying hour costs exceed the DA standard cost rate, it is most important that this information be transmitted to HQDA for updating data.

Source: DA COMPT (DACA-CA)
AUTOVON 225-3568

4-2. Costs per Flying Hour.

FIXED WING	Field 1/ OMA Parts	Field 2/ Labor	1/ POL	PEMA 3/ Parts	Depot 4/ OMA Parts	Depot 4/ Labor	Estimated Total FH Cost
OV-1	\$117	\$ 54	\$ 84	\$24	\$ 70	\$ 88	\$ 437
U-1	33	41	28	1	20	10	133
U-10	—	—	—	—	—	—	—
U-21/RU-21	24	37	55	1	25	34	186
T-41	—	—	—	—	—	—	—
T-42	33	41	26	1	20	10	131
C12A	N/A	—	47	—	—	—	—
UV-18A							
ROTARY WING							
OH-6	\$ 38	\$ 20	\$ 9	\$ 0	\$ 23	\$ 21	\$ 111
OH-58	38	19	11	3	25	21	117
UH-1	59	28	45	3	48	52	235
AH-1	155	75	49	20	52	53	404
CH-47	318	88	198	63	244	265	1176
CH-54	336	116	180	65	323	381	1401
UH-60	—	—	—	—	—	—	—
YAH-64	—	—	—	—	—	—	—

1/ Program 2 costs per flying hour.

2/ MPA (MMH) costs per flying hour.

3/ PEMA costs per flying hour. Consists of PEMA II recurring repair parts.

4/ Program 7 costs per flying hour. Includes airframe and component overhaul costs. Airframe overhaul costs are based on 5-year overhaul cycle and flying hour program for TOE aircraft.

Note: The factors above change frequently and should be used for planning only. Official flying hour costs for reimbursement claims are developed by the Department of the Army Comptroller. Costs are in FY 78 dollars

Source: DA Compt (DACA)

Section II. AIRCRAFT UNIT FLYAWAY COSTS

4-3. Rotary Wing Unit Price.

HELICOPTER	NATIONAL STOCK NUMBER	LINE ITEM NUMBER	TYPE	STANDARD PRICE*
AH-1G ^{1/}	1520-00999-9821	K29660	Attack	509,833
TH-1G ^{2/}	1520-00804-3635	K29762	Trainer	531,679
CH-47A	1520-00633-6836	K30378	Cargo Transport	990,717
CH-47B	1520-00990-2941	K30383	Cargo Transport	1,063,448
CH-47C	1520-00871-7308	K30449	Cargo Transport	3,223,625
YCH-47D	—	Z33490	Cargo Transport	—
CH-54A ^{3/}	1520-00964-9601	K30515	Cargo Transport	2,660,828
CH-54B	1520-00113-5776	K30516	Cargo Transport	2,817,371
OH-6A	1520-00918-1523	K30645	Observation	125,821
OH-58A	1520-00169-7137	K31042	Observation	144,722
OH-58C	1520-01020-4216	Z33527	Observation	201,898
UH-1B	1520-00713-9912	K31749	Utility	244,760
UH-1C	1520-00997-8862	K31767	Utility	224,415
UH-1D	1520-00859-2670	K31786	Utility	237,504
UH-1V	1520-01043-4949	—	Utility/Med Evac	618,055
UH-1H	1520-00087-7637	K31795	Utility	618,055 ✓
EH-1H	1520-00368-8442	K30548	Utility/Quick Fix	1,920,000
UH-1M	1520-00809-2631	K31804	Utility	247,758
EH-1X	1520-01042-9396	H30829	Utility/Quick Fix	1,920,000
TH-55A	1520-00758-0289	K31153	Primary Trainer	35,590
AH-1S	1520-00504-9112	K29694	Attack	1,537,000 ^{4/}
UH-60A	1520-0135-0266	K32293	Utility	2,282,200
YAH-64A	—	Z33149	Attack	—

*Published in DA Supply Bulletin 700-20, Army Adopted/Other Selected Items and List of Reportable Items. Price includes avionics and \$1,500 first destination transportation charges. Excludes armament systems except where annotated. (Refer to chapter 2.)

^{1/} Includes estimate of average cost of armament, \$69,000.

^{2/} Includes estimate of average cost of armament, \$58,242.

^{3/} Includes \$13,000 ground equipment.

^{4/} Represents average cost of total new production/modernized AH-1S aircraft

NOTE: Aircraft type classified contingency or obsolete not included.

Source: DARCOM PM's
TSARCOM RPO's & PM's

4-4. Fixed Wing Unit Price.

AIRCRAFT	NATIONAL STOCK NUMBER	LINE ITEM NUMBER	TYPE	STANDARD PRICE*
U-8D	1510-00574-7938	A30721	Utility	115,250
U-8F	1510-00701-2233	A30821	Utility	144,593
U-8G	1510-00912-4084	A30831	Utility	114,687
RU-8D	1510-00945-9998	A30465	Reconnaissance Utility	295,250
C-12A	1510-01005-5461	A29676	Utility	680,883
U-10A	1510-00964-9780	A30971	Utility STOL	55,824
U-21A	1510-00933-8223	A30946	Utility	348,844
U-21F	1510-00169-0295	A30951	Utility	494,800
U-21G	1510-00140-1627	A30953	Utility	391,218
RU-21A	1510-00587-3375	A30582	Reconnaissance Utility	587,004
RU-21B	1510-00878-4338	A30583	Reconnaissance Utility	1,257,811
RU-21C	1510-00878-4336	A30584	Reconnaissance Utility	1,259,760
RU-21D	1510-00804-3641	A30585	Reconnaissance Utility	875,004
RU-21H	1510-00394-3320	A30591	Reconnaissance Utility	1,501,200
RU-21J	1520-00124-0914	Z04615	Reconnaissance Utility	1,817,888
OV-1B	1510-00715-9379	A30221	Observation/Surveillance	976,437
OV-1C	1510-00715-9380	A30271	Observation/Surveillance	1,058,540
OV-1D	1510-00869-3654	A30296	Observation/Surveillance	2,033,066
RV-1D	1510-00368-8440	A30444	Observation/Surveillance	2,886,664
T-41B	1510-00929-1012	A30053	Trainer, Flight	16,200
T-42A	1510-00872-7908	A30596	Trainer, Instrument	102,907
UV-18A	1510-01011-1462	A30989	Utility	714,945

* Published in DA Supply Bulletin 700-20, Army Adopted/Other Selected Items and List of Reportable Items. Price includes avionics and \$1,500 first destination transportation charges. Excludes armament systems (Refer to chapter 2).

NOTE: Aircraft type classified contingency or obsolete not included.

Source: DARCOM PM's
TSARCOM RPO's & PM's

Section III. AVIONICS COSTS

4-5. Avionics Estimated Maintenance Cost Factors.

To obtain current data such as labor costs or parts costs on avionics equipment or systems contact CERCOM (DRSEL-ME-E) AUTOVON 992-1685.

Source: CERCOM (DRSEL-ME-E)

Section IV. ARMAMENT COSTS

4-6. Airborne Armament Maintenance Costs.

To obtain current labor and parts costs on aircraft/weapon subsystems contact DRSAR-MAS-SS, AUTOVON 793-5668.

Source: DRSAR-MAS-SS

CHAPTER 5

RESEARCH AND DEVELOPMENT OF MATERIEL

Army aviation research and development is conducted on aircraft systems and in areas not directly related to specific aircraft systems. Research not directly related to aircraft systems includes low speed aerodynamics, structures, and propulsion. Exploratory development is conducted in such areas as area fluid dynamics, aeromechanics, flight dynamics, flight loads, aircraft structures and composite materials, power devices, propulsion components, aircraft survivability, aircraft ground support equipment, reliability/maintainability, avionics technology, and aircraft weapons.

5-1. General.

a. Research aircraft are procured in limited quantities to evaluate concepts during the Research, Exploratory Development and Advanced Development phases of the R&D cycle.

b. Development aircraft systems are aircraft systems proposed for operational use to replace or complement current Army aircraft systems.

5-2. Development Aircraft Systems.

The following development aircraft systems are in order of priority.

5-3. YAH-64A (AAH).

The AAH is a twin engine rotary wing aircraft designed as a stable, manned aerial weapons system. The AAH will become the primary attack helicopter and will be complemented by the AH-1 series attack helicopter.

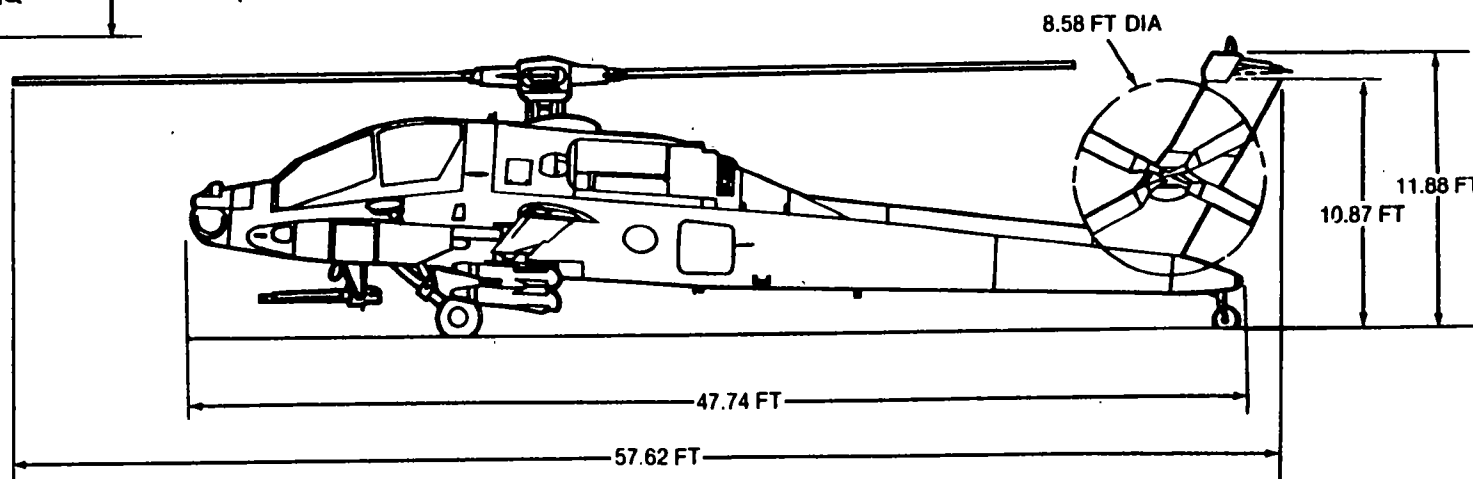
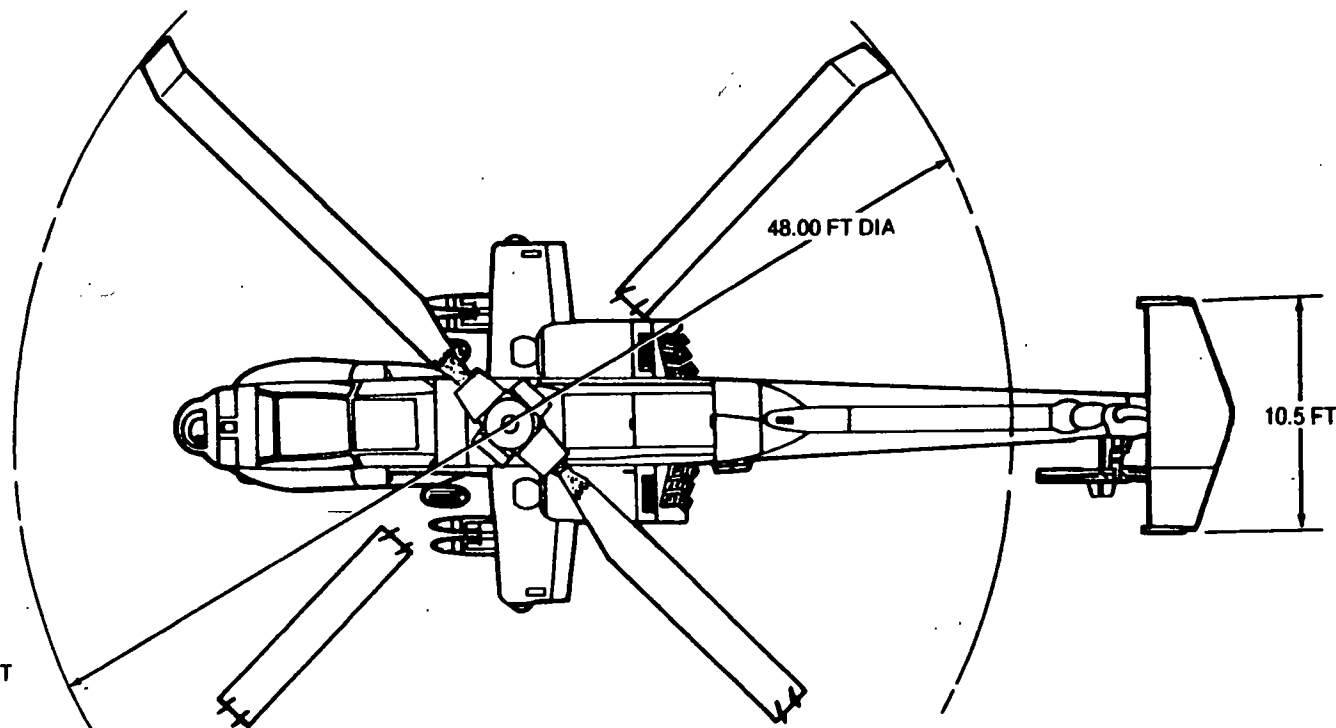
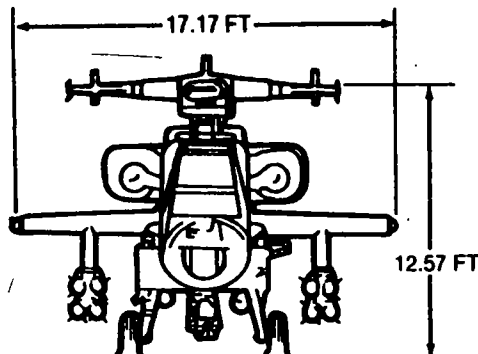


Figure 5-1. Advanced Attack Helicopter (AAH) Hughes Model - YAH-64)

DIMENSIONS

Rotor Dia..... 48.0 Ft.
 Length:
 Static.....
 Operating.....
 Fuselage.....
 Span (Max
 Lateral)..... 17.17 Ft.
 Height..... 12.57 Ft.
 Tread.....
 Rotor Grd Clearance:
 (Static).....

Figure 5-2. YAH-64A (AAH)



5-4. YAH-64A (AAH) Characteristics.

ENGINE			MISSION AND DESCRIPTION		WEIGHTS	
No. and Model (2)T700-GE-700 Mfr General Electric Engine Spec. No. DARCOM-CP-2222-02000B Type Free Power Turbine Reduction Gear Ratio 72.42:1 Tail Pipe Fixed Area Augmentation None			Advanced Attack Helicopter (AAH) The YAH-64A is being developed primarily for destruction of armored vehicles, but is capable of defeating a wide range of other targets. It will provide direct aerial fires as an integral element of the ground units and will be responsive around the clock and under adverse weather conditions. It will contribute highly mobile, effective and accurate anti-armor firepower with the hellfire laser guided anti-armor missile, 30mm chain gun and 2.75 inch rockets. The AAH is equipped with an Integrated Target Acquisition and Designation System (TADS) and a Pilot's Night Vision System (PNVS). The aircraft is designed to survive against current and future enemy threats on the battlefield.		LOADING LB. Empty 10,268 Basic 14,660 Design 13,825 Combat (Primary) 13,825 (Max Alt) 17,650 (Ferry) 18,500	
ENGINE RATINGS Intermediate 1543 SL/STD Max Continuous 1251 SL/STD			DEVELOPMENT Date of contract Jun 1973 First flight (similar aircraft) Mar 1975 First acft delivered (Production) Dec 1982		FUEL AND OIL Fuel: Grade JP 4/5 Spec. MIL-T-5624J No. tanks 2 Location Fuselage Qty 365.2 Gal Usable Oil: Spec. MIL-L-7808G/ MIL-L-23699B No. tanks 2 Location Integral w/ Engine Qty 3.40 Gal	
TECHNICAL PUBLICATIONS AIRFRAME: NOT AVAILABLE ENGINE:			FEATURES Not Available	PERSONNEL Pilot 1 Co-Pilot/Gunner 1	AVIONICS / ARMAMENT Refer to chapter 2.	
					FLYAWAY COSTS / NSN NSN — Not Available Lin Z 33149 Costs — Not Avail	

5-5. Loading and Performance - Typical Mission YAH-64A

Conditions		Primary Mission	Mission I	Mission II	Mission III	Mission IV	Ferry Mission
Mission Gross Weight (Take Off)	(lbs)	13825	14202	15430	15430	15430	18500
Payload (Expendable Ordnance)							
HELLFIRE	(lbs/no)	704/8	704/8	1408/16	704/8		
2.75" Rockets	(lbs/no)				1072/38	2143/76	
30MM	(lbs/no)	247/320	616/800	760/986	482/626	204/265	
Fuel (Usable)	(lbs)	1542	1550	1542	1542	1542	6914**
Vertical Rate of Climb OGE @ 4000 ft, 95°F, 95% IRP	(FPM)	880	625	<0	<0	<0	<0
Rate of Climb @ 80 kts, 4000 ft, 95°F, IRP	(FPM)	2480	2330				
Cruise Speed @ 4000 ft, 95°F, MCP	(KTAS)	146	145	138	139	139	
Endurance @ 4000 ft, 95°F	(Hrs)	1.83	1.83	1.70	1.68	1.68	
Hover Ceiling OGE 95°F, 95% IRP	(Ft)	6160	5460	3300	3300	3300	<0
Hover Ceiling IGE 95°F, 95% IRP	(Ft)	8000*	8000*	6140	6140	6140	1400
Service Ceiling Standard Day, IRP	(Ft)	> 20000****	> 20000****				
Service Ceiling Single Engine, Standard Day, IRP	(Ft)	11500 ****	10750 ****				
Service Ceiling Single Engine, 95°F, IRP	(Ft)	5600****	4900****				
Ferry Range	(NM)						820***
CONDITIONS			Alternate Mission IA	Alternate Mission IIA	Alternate Mission IIIA	Alternate Mission IVA	Alternate Mission VA
Mission Gross Weight (Take Off)	(lbs)		15026	16262	16262	16262	16982
Payload (Expendable Ordnance)			same as above	same as above	same as above	same as above	
Hellfire	(lbs/no)		↓	↓	↓	↓	0
2.75" Rockets	(lbs/no)						2143/76
30MM	(lbs/no)						924/1200
Fuel (Full Usable)	(lbs)		2374	2374	2374	2374	2374
Endurance @ Sea Level, Std. Day	(hrs)		2.61	2.51	2.53	2.53	2.50

- * Engine Operating Limit - 8000 ft, 95°F
- ** With External Fuel Tanks
- *** With 20 Knot Headwind
- *** At the Above Mission Gross Weights

5-6. Performance Notes, YAH-64A (AAH).

Formula: Primary Mission — Entire mission performed at 4000 ft, 95 F, 8 minutes at maximum continuous power, 30 minutes at 0-40 KTAS @ DGW*, 12 minutes at 80-100 KTAS @ DGW*, 5 minutes at 150 KTAS @ DGW, 25 minutes HOGE @ DGW*, 30 minutes reserve at max range speed @ DGW minus expendable ordnance minus fuel consumed.

*Computed $\frac{1}{2}$ at DGW (mission gross weight) and $\frac{1}{2}$ at DGW less $\frac{1}{2}$ the expendable ordnance payload.

Formula: Alternate Mission I — Same as Primary Mission.

Formula: Alternate Mission II — Same as Primary Mission, except time at 80-100 KTAS is 4.2 minutes.

Formula: Alternate Mission III — Same as Primary Mission, except time at 80-100 KTAS is 2.6 minutes.

Formula: Alternate Mission IV — Same as Primary Mission, except time at 80-100 KTAS is 2.8 minutes.

Formula: Ferry Mission — Auxiliary fuel tanks utilized. 20 knot headwind. A 45 minute fuel reserve at max range speed shall be provided for flights up to 3 hrs in length. For flights over 3 hrs, reserve shall be increased by 10% of the additional fuel at the airspeed and headwind required above. 2 minutes at MCP shall be allowed for warm-up and take off. The mission shall be performed at standard day conditions with takeoff at sea level.

Formula: Alternate Mission IA — Entire mission performed at sea level standard day conditions, 8 minutes at maximum continuous power, 25 minutes HOGE @ AGW*, 30 minutes 0-40KTAS @ AGW*, 21.4 minutes at 150 KTAS @ AGW, 30 minutes at maximum endurance speed @ AGW* 12 minutes 80-100 KTAS @ AGW*, 30 minutes reserve at maximum range speed @ AGW minus expendable ordnance minus fuel consumed.

*Computed $\frac{1}{2}$ at AGW (sea level mission gross weight) and $\frac{1}{2}$ at AGW less $\frac{1}{2}$ the expendable ordnance payload.

Formula: Alternate Mission IIA — Same as IA, except time @ 150KTAS is 15.6 minutes.

Formula: Alternate Mission IIIA — Same as IA, except time @ 150 KTAS is 16.9 minutes.

Formula: Alternate Mission IVA — Same as IA, except time @ 150 KTAS is 16.9 minutes.

Formula: Alternate Mission VA — Same as IA, except time @150 KTAS is 15.1 minutes.

Performance Reference: System Specification AMC-SS-AAH-H10000A, YAH-64 Phase 2 Advanced Attack Helicopter.

Source: DRCPM-AAH-LM (2)

5-7. Remotely Piloted Vehicle (RPV).

a. The RPV system is designed to provide realtime target acquisition and combat information beyond line of sight of its supported ground forces. The system has the capability to detect, recognize, and identify targets and assist artillery engagement out to 20KM forward of the line of contact (LC). Combat effectiveness will be increased especially against cold, non-moving, non-emitting targets while reducing the exposure of manned aircraft of the enemy. The system has the ability to perform airborne target acquisition and location, adjustment of field artillery fire control, laser designation for all tri-service precision guided munitions, reconnaissance missions, and damage assessment. The airframe will be a fixed wingtype with an air-cooled, two cylinder, two stroke engine developing approximately 20-25 horsepower propeller driven.

RPV milestone schedule and illustration will be made available following award of the full scale engineering contract.

Source: DRDAV-RP



APPENDIX A

REFERENCES

ARMY REGULATIONS (AR) (DA REG 310-1)

70-50 Designating and Naming Military Aircraft, Rockets, and Guided Missiles.
95-70 Army Aviation Planning Manual.
310-50 Authorized Abbreviations and Brevity Codes.
310-25 Dictionary of United States Army Terms.
570-2 Organization and Equipment Authorization Tables - Personnel.
611-201 Enlisted Career Management Fields and Military Occupational Specialties.
750-1 Army Materiel Maintenance Concepts and Policies.

FIELD MANUALS (FM) DA PAMP 310-5)

1-100 Army Aviation Utilization.
1-105 Army Aviation Techniques and Procedures.
21-5 Military Training Management.
21-6 How to Prepare and Conduct Military Training.
21-30 Military Symbols.
21-60 Visual Signals.
55-15 Transportation Reference Data.
55-40 Army Combat Service Support Air Transport Operations.
57-35 Airmobile Operations.
101-10 Staff Officers' Field Manual: Organization, Technical, and Logistical Data
(Part I — Unclassified).

TECHNICAL MANUALS (TM) (DA PAMP 310-4)

55-450-8 Air Transport of Supplies and Equipment: External-Transport Procedures.
55-450 series Air Transport of Supplies and Equipment: Internal-Transport Procedures.

APPENDIX A (CONT.)

55-450-15 Air Movement of Troops and Equipment (Non-Tactical).

SUPPLY BULLETIN(S)

SB 700-10 Army Adopted/Other Selected Items S¹ List of Reportable Items.

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PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.
6	2-1 a		
81		4-3	
125	line 20		

In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.

Callout 16 on figure 4-3 is pointing at a bolt. In the key to fig. 4-3, item 16 is called a shim. Please correct one or the other.

Ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN.

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